

DOE/EA-1816

Final  
Environmental Assessment

for the

Town of Hempstead  
Wind-to-Hydrogen Project  
Point Lookout, New York

U.S. Department of Energy  
Office of Energy Efficiency and Renewable Energy  
Golden Field Office  
Golden, Colorado



February 2011



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## COVER SHEET

**RESPONSIBLE AGENCY:** U.S. Department of Energy (DOE)

**TITLE:** *Final Environmental Assessment for the Town of Hempstead Wind-to-Hydrogen Project, Point Lookout, New York* (DOE/EA-1816)

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**ABSTRACT:** The U.S. Department of Energy (DOE) has provided a grant to the Town of Hempstead, New York (the Town) under the Energy Efficiency and Conservation Block Grant (EECBG) Program, and Town Hempstead intends to use the funds to design, permit, and construct a 100-kilowatt wind turbine at Point Lookout, New York. The proposed project would include installation of an underground electrical line from the turbine to the station. The system would convert wind energy to electricity and use that to power an electrolyzer to make pure hydrogen for the Town's fueling facility for the Town's small fleet of vehicles (proposed project). DOE provided the grant under the American Recovery and Reinvestment Act of 2009 and as part of the Energy Efficiency and Conservation Block Grants Program. DOE's Proposed Action would authorize a total of \$400,000 in grant expenditures by the Town of Hempstead. The total cost of the Town's proposed project would be approximately \$600,000. DOE has authorized the Town to use a percentage of the Federal funding for preliminary activities, which includes project planning and support for the development of this EA. The preliminary activities are associated with the proposed project and do not significantly impact the environment nor represent an irreversible or irretrievable commitment by DOE in advance of the conclusion of the EA.

This draft EA analyzes the potential environmental consequences of the proposed construction, operation, and decommissioning of the Town of Hempstead's Wind-to-Hydrogen Project (Proposed Project) and the alternative of not implementing this project (the No-Action Alternative).

**PUBLIC INVOLVEMENT:** DOE conducted scoping with Federal, state, local, and other potentially interested agencies, organizations, and individuals for this EA. DOE conducted consultations with the New York State Historic Preservation Office, the U.S. Fish and Wildlife Service, the Shinnecock Indian Nation, the Unkechaug Indian Nation of Poospatuck Indians, the Delaware Nation of Oklahoma, and the Delaware Tribe. DOE issued the Draft EA for public comment on December 22, 2010, and posted it on the DOE Golden Field Office Public Reading Room website. The comment period ended on January 14, 2011. DOE did not receive comments on the Draft EA.

**AVAILABILITY:** The Final EA is available on the DOE Golden Field Office website at [http://www.eere.energy.gov/golden/Reading\\_Room.aspx](http://www.eere.energy.gov/golden/Reading_Room.aspx).

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## ACRONYMS AND ABBREVIATIONS

APE	area of potential effect
ARRA	American Recovery and Reinvestment Act of 2009
C.F.R.	<i>Code of Federal Regulations</i>
dB	A-weighted decibels
DOE	U.S. Department of Energy
EA	Environmental Assessment
EECBG	Energy Efficiency and Conservation Block Grants
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FWS	U.S. Fish and Wildlife Service
NEPA	National Environmental Policy Act of 1969, as amended
NRHP	<i>National Register of Historic Places</i>
SEQR	State of New York Environmental Quality Review Act
SHPO	State Historic Preservation Office
Stat.	United States Statutes
U.S.C.	<i>United States Code</i>

Note: Numbers in this EA generally have been rounded to two or three significant figures. Therefore, some total values might not equal the actual sums of the values.

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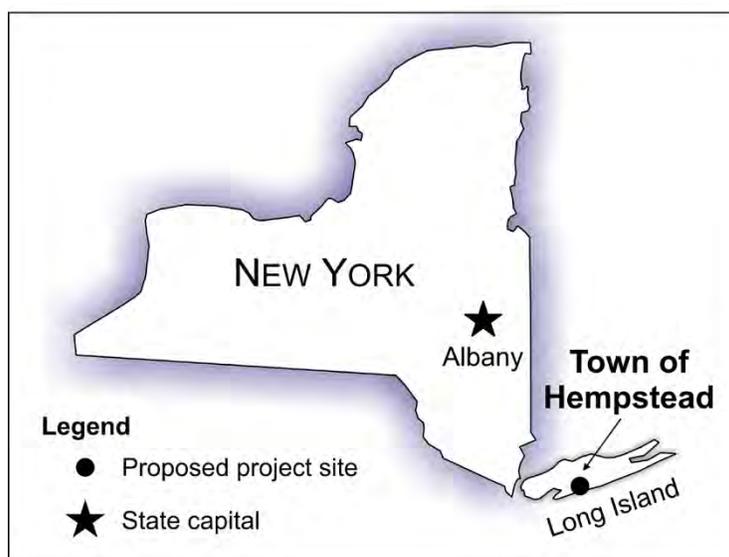
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## 1. INTRODUCTION

As part of the American Recovery and Reinvestment Act of 2009 (ARRA; Public Law 111-5, 123 Stat. 115), the U.S. Department of Energy (DOE) is providing Federal grants as part of the Energy Efficiency and Conservation Block Grants (EECBG) Program. ARRA appropriated \$3.2 billion to DOE to distribute under the EECBG Program to States, territories, and eligible cities, counties, and American Indian Nations across the United States to reduce fossil fuel emissions, benefit local and regional communities, and reduce total energy use. Of the \$3.2 billion, communities in New York are eligible to receive approximately \$145 million in grants, and the State of New York itself is eligible for an additional \$30 million.

DOE has provided an EECBG grant to the Town of Hempstead, New York (the Town); part of which the Town is seeking to use for the design, permitting, and construction a 100-kilowatt wind turbine at Point Lookout, New York (proposed project). The wind turbine would supply electricity to the Town's existing hydrogen and natural gas fueling station. Figure 1-1 shows the location of the Town of Hempstead.



**Figure 1-1. General location of the Town of Hempstead, New York.**

The purpose of this Environmental Assessment (EA) is to evaluate the potential environmental consequences of authorizing the Town to expend Federal funding on its proposed project.<sup>1</sup> DOE's Proposed Action would authorize a total of \$400,000 in grant expenditures by the Town for the proposed project. The total cost of the proposed project would be about \$600,000. Federal funding of projects requires compliance with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et. seq.). In accordance with NEPA implementing regulations, DOE is required to evaluate the potential environmental impacts of Federally related funding decisions. Thus, preparation of this EA addresses NEPA compliance and the related environmental consequences of the Proposed Action. Therefore, DOE

<sup>1</sup> DOE has authorized the Town to use a percentage of the Federal funding for preliminary activities, which includes project planning and support for the development of this EA. The preliminary activities are associated with the proposed project and do not significantly impact the environment nor represent an irreversible or irretrievable commitment by DOE in advance of the conclusion of the EA.

has issued this *Final Environmental Assessment for the Town of Hempstead Wind-to-Hydrogen Project, Point Lookout, New York* (DOE/EA-1816).

This chapter explains NEPA requirements (Section 1.1), State of New York Environmental Quality Review Act requirements (Section 1.2), DOE's purpose and need for action (Section 1.3), and the public involvement process and consultations with other agencies and American Indian Nations (Section 1.4).

Chapter 2 discusses DOE's Proposed Action, the Town's proposed project, and the No-Action Alternative. Chapter 3 discusses the environmental resource areas DOE did not carry forward to detailed analysis, the affected environment, the potential environmental consequences of the proposed project, and the No-Action Alternative. Chapter 4 discusses cumulative impacts, and Chapter 5 discusses irreversible and irretrievable commitments of resources. The remaining sections of the EA provide references and background information to support the findings in the EA. Appendix A contains copies of DOE's scoping letter and consultation letters with other agencies and four American Indian Nations. Appendix B lists New York-designated special-status plant species in support of the analysis of potential biological impacts.

## **1.1 National Environmental Policy Act Requirements**

In accordance with DOE's NEPA implementing procedures, DOE must evaluate the potential environmental impacts of its Proposed Action that could have a significant impact on human health and the environment, including decisions on whether to provide financial assistance to government agencies and private entities. In compliance with these regulations and DOE's procedures, this EA:

- Examines the potential direct and indirect environmental impacts of the Proposed Action and the No-Action Alternative,
- Identifies unavoidable adverse environmental impacts if the Proposed Action is implemented,
- Characterizes irreversible and irretrievable commitments of resources that would be involved if DOE approved the Proposed Action, and
- Analyzes past, present, and reasonably foreseeable actions to evaluate potential cumulative impacts.

DOE must meet the requirements of NEPA before it can make a final decision to proceed with a proposed Federal action that could cause significant impacts to human health or the environment. In compliance with NEPA regulations, this EA examines the potential environmental impacts of the DOE's Proposed Action (providing funding for the Proposed Project) and the No-Action Alternative. This EA provides DOE and other decision-makers the information necessary to make an informed decision about whether allowing the Town to use Federal funds for the proposed project could result in significant environmental impacts.

## **1.2 State of New York Environmental Quality Review Act**

The State of New York has additional regulations on the conduct of environmental reviews (Title 9, Section 617, *New York Codes, Rules and Regulations*) under the State of New York Environmental Quality Review Act (SEQR). The regulations specify that a Federal NEPA EA and the associated decisions do not automatically constitute compliance with the New York regulations and that state and local agencies remain responsible for compliance. The New York regulations allow the responsible state

or local agency to consider the results of an EA and associated FONSI in its determination. State and local agencies may use documents from a NEPA review as support for their required determinations or findings. For example, a FONSI could serve as the basis for a negative declaration under the New York regulations because it would present the basis for the decision. Another example would be the state using an EA and FONSI as supporting documentation to make a consistency determination that the proposed project is consistent with state coastal zone management requirements (Article 42 of the State Executive Law, Title 19, Part 600, and Title 6, Part 617, *New York Codes, Rules and Regulations*).

While, the New York regulations require scoping, public notice, and public comment for environmental impact statements, they do not have comparable requirements for EAs. Although scoping for an EA is optional under NEPA, DOE conducted scoping for this EA. In addition, DOE provided, pursuant to NEPA EA requirements, notices of this EA's availability and a 15-day public comment period. A comparison and description of the NEPA and State of New York environmental review processes is available in *The SEQOR Handbook, 3rd Edition - 2010* (NYDEC 2010a). The Town of Hempstead has established its responsibility under the New York regulations in its town code at Chapter 154, "Environmental Quality Review."

### **1.3 Purpose and Need of DOE's Proposed Action**

The purpose of the Proposed Action is to support the mission of the EECBG Program established by Congress and implemented by DOE to reduce energy use and emissions at the local and regional level. Providing funding as part of the EECBG Program would partially satisfy the need of that program to assist U.S. cities, counties, states, territories, and Indian tribes to develop, promote, implement, and manage energy efficiency and conservation projects and programs designed to:

- Reduce fossil fuel emissions;
- Reduce the total energy use of the eligible entities; and
- Improve energy efficiency in the transportation, building, and other appropriate sectors.

The EECBG Program received funding through ARRA. That law was enacted in part to create jobs, restore economic growth, and strengthen America's middle class through measures that modernize the nation's infrastructure, enhance America's energy independence, expand educational opportunities, preserve and improve affordable health care, provide tax relief, and protect those in greatest need. Provision of funds under the EECBG Program would partially satisfy the needs identified under ARRA.

### **1.4 Public Involvement and Consultations**

#### ***Public Scoping***

This Final EA was posted on December 22, 2010, and is open for public comment through January 14, 2011. In accordance with applicable regulations and policies, DOE sent postcards to potentially interested agencies to notify them of the scoping letter, which it posted on its Golden Field Office Public Reading Room website at [http://www.eere.energy.gov/golden/Reading\\_Room.aspx](http://www.eere.energy.gov/golden/Reading_Room.aspx). DOE notified local, state, and Federal agencies including the New York Governor's office, the Shinnecock Indian Nation, and the Unkechaug Indian Nation of Poospatuck Indians the scoping letter (Appendix A).. In addition, DOE sent a formal consultation letter to the New York State Historic Preservation Office (SHPO) in compliance with Section 106 of the National Historic Preservation Act (16 U.S.C. 470 *et seq.*) and a letter to the U.S. Fish and Wildlife Service (FWS) to meet its obligation under Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*).

Through the scoping process, DOE solicited input on the range and scope of issues it should consider in this EA. The scoping period ended on October 1, 2010. The U.S. Environmental Protection Agency (EPA) responded and requested examination of potential effects on the water table. EPA asked the following questions: (1) how far would the turbine foundation extend below the surface and (2) whether it would extend below the water table and, if so, how the Town would dewater the excavated space before or during installation. EPA also requested information on the closest public water supplies to the proposed project site and if there are residents within a mile of the site (on the barrier island) that use private wells (Appendix A).

DOE answered these questions in Section 2.2.2 on the range of potential foundations types and depths, and in Section 3.2 on water table and local water use.

### **Consultations**

In addition, DOE initiated formal consultation with the New York SHPO, the FWS, the Shinnecock Indian Nation, the Unkechaug Indian Nation of Poospatuck Indians, the Delaware Nation of Oklahoma, and the Delaware Tribe (Appendix A). Because the height of the proposed wind turbine would be less than that regulated by the Federal Aviation Administration, formal consultation is not required; however, DOE notified the Administration of the scoping period and the availability of the Draft EA for public comment.

The New York SHPO responded to DOE's consultation letter on November 8, 2010. The SHPO determined that the proposed project would not affect a nearby known archaeologically sensitive area (a presumed tugboat wreck) due to distance and has no archaeological concerns. The SHPO reserved judgment on aboveground cultural resources until seeing visual simulations of the wind turbine in place. DOE sent approximations of the turbine's appearance after installation for evaluation on October 18, 2010. DOE received a response from the SHPO on January 7, 2011, who concurred with DOE's determination that the project would have no effect on historic properties either listed or eligible for listing on the *National Register of Historic Properties* (NRHP). In addition, the SHPO recommended that DOE consult with the Delaware Nation of Oklahoma and the Delaware Tribe to initiate consultation, both of whom have expressed interest in the western Long Island area. DOE sent letters to these two tribes on October 18, 2010. The SHPO also indicated that DOE should investigate the potential for impacts to New York State Parklands. DOE determined that the closest parkland to the site is the Jones Beach State Park, Causeways, and Parkways System, on which both DOE and the New York SHPO determined there would be no effect. The Delaware Tribe responded on December 13, 2010, and indicated there are no known religious or culturally significant sites in the area of the proposed project.

As of the date of publication of this EA, DOE had not received responses from the other agencies and tribes.

### **Public Comment Period**

DOE issued the Draft EA for public comment on December 22, 2010, and posted it on the DOE Golden Field Office Public Reading Room website. The comment period ended on January 14, 2011.

The EPA sent a comment letter (Appendix A) on January 24, 2011, that stated, "EPA concurs with the Department of Energy that the proposed project should not significantly impact the environment." Further, EPA stated, "provided that fuel, lubricants and other potentially hazardous materials in use during construction are properly contained, we do not anticipate that this project will result in significant adverse impacts to ground water quality." EPA's determination was part of its review of the potential impacts to the Nassau-Suffolk Aquifer System, which was designated as a Sole Source Aquifer in 1978.

The review was in accordance with Section 1424(e) of the 1974 Safe Drinking Water Act. Section 3.2 of the EA discusses the sole source aquifer and other water related issues. As stated in Table 3-1 and Section 3.2, the Town would manage fuel lubricants, and other potentially hazardous wastes under the existing local practices including spill prevention and mitigation measures.

DOE did not receive other comments on the Draft EA.

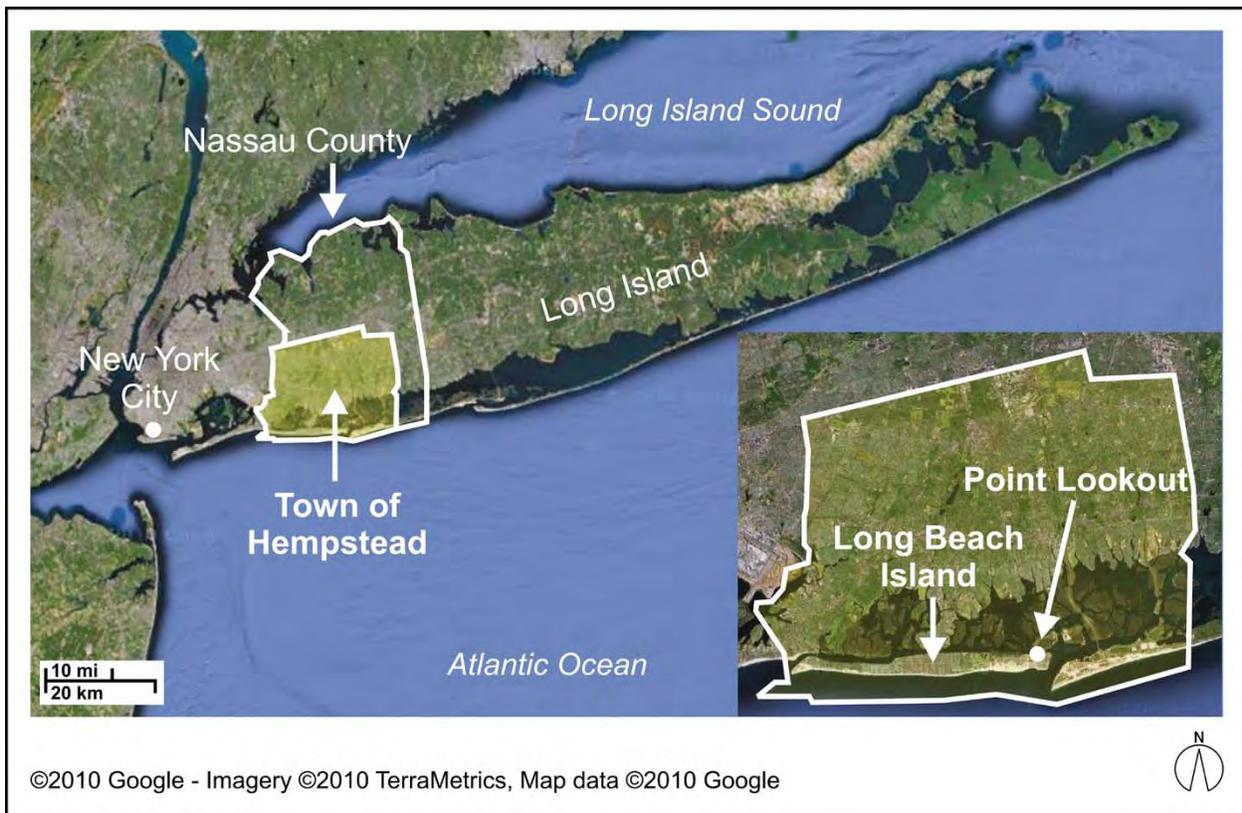
## 2. PROPOSED ACTION AND ALTERNATIVES

### 2.1 DOE's Proposed Action

The Town of Hempstead intends to use a portion of its EECBG grant to design, permit, and construct a 100-kilowatt wind turbine at Point Lookout, New York. DOE's Proposed Action in this EA to authorize the expenditure of Federal funding to design, permit, and construct a 100-kilowatt wind turbine by the Town. DOE has authorized the Town to use a percentage of its federal funding for preliminary activities, which include support for the preparation of this EA and preliminary studies. The activities are associated with the proposed project and do not significantly impact the environment nor represent an irreversible or irretrievable commitment by DOE in advance of the conclusion of the EA for the proposed project. The total cost of the proposed project is around \$600,000.

### 2.2 The Town of Hempstead's Proposed Project

The Town's proposed project is to construct and operate a 100-kilowatt wind turbine collocated with the Town's existing hydrogen and natural gas fueling station at 320 Lido Boulevard, Point Lookout, New York. The proposed project site is in Nassau County. Point Lookout is at the east end of Long Beach Island, which lies between Reynolds Channel and the Atlantic Ocean. Figure 2-1 shows the general location of Point Lookout in the Town of Hempstead and the greater Nassau County, Long Island, and New York City region.



**Figure 2-1. Location of Point Lookout in the Town of Hempstead, New York.**

The Town has the largest township population in the United States. It encompasses more than 142 square miles and has 37 unincorporated areas and 22 incorporated villages and hamlets, including Point Lookout.

There are more than 65 parks and marinas, 2,500 miles of city, county, state, and Federal roads, 17,000 acres of wetlands, and 180 miles of coastal waterways (Town of Hempstead 2010a).

### **2.2.1 Project Location and Uses**

The proposed project would be part of the Town's overall Clean Energy Project, an initiative to implement and demonstrate clean, renewable, and sustainable energy technologies through strategic partnerships. Solar energy, wind energy, and alternative fuels such as hydrogen are all part of the Town's clean energy portfolio (Town of Hempstead 2009a). As Figure 2-2 shows, current Clean Energy Project facilities at Point Lookout include a solar- and wind-powered shellfish farm with a 2.4-kilowatt wind turbine and two 5-kilowatt solar arrays, a 10-kilowatt solar array on the roof of the Administration Building, a zero-energy solar home (built by the New York Institute of Technology), and the hydrogen and natural gas fueling station. The proposed project would be located on this site, which is Town property.

Figure 2-2 shows the Clean Energy Project facilities and the 4-acre proposed project site (dotted line) that includes the existing fueling station and the Department of Conservation and Waterways Administration Building. The boundaries of the proposed project site are the Loop Parkway to the east, the West Marina access road to the west, the marina walkway to the north, and Lido Boulevard to the south. The Town would locate the proposed wind turbine in the northeast corner of this 4-acre area but has not determined the exact location of the proposed turbine because that determination depends on geotechnical and siting studies that are not yet complete. To analyze the potential impacts of the proposed project in this EA the proposed project is sited in that northwest corner. The impacts of the project would be essentially the same at any specific site within the northwest corner. Figure 2-3 is a close-up of the 4-acre site.

Site preparation activities would include clearing heavy brush around the proposed turbine site. There would be two construction trailers in the parking lot of the Administration Building, and crews would develop an access route to the wind turbine site from the parking lot. The construction staging or laydown area would encompass an area of about 4,500 square feet. A vendor would deliver the wind turbine components in two shipments. The Town's wind turbine contractor would use a 100-ton crane to install the tower and turbine. The crane pad area would require about 1,200 square feet. The area of the tower foundation is discussed in Section 2.2.2. There would be one electrical tie-in to the fueling station underground and about 200 feet long that would require additional switchgears.

The Town owns and operates the hydrogen and natural gas fueling station at Point Lookout. The station currently uses about 200,000 kilowatt-hours per year of electricity from the grid to run an electrolyzer to generate hydrogen. The hydrogen and natural gas are stored on the site in aboveground storage tanks. The Town dispenses pure hydrogen, a hydrogen and natural gas blend, and compressed natural gas to fuel a small fleet of Town vehicles. The electrolyzer also produces oxygen, which is released to the air. The Town would use the proposed wind turbine to generate renewable electricity to run the fueling station including the electrolyzer that produces the hydrogen. The system would tie-in to the local electrical grid so that excess power, if any, would be available for other users. Each year, the proposed project would replace about 200,000 kilowatt-hours of electricity (at an average wind speed of 13 miles per hour), which the Town currently purchases from the local electrical grid. Figure 2-4 is a schematic of the hydrogen manufacturing process using the proposed wind turbine.

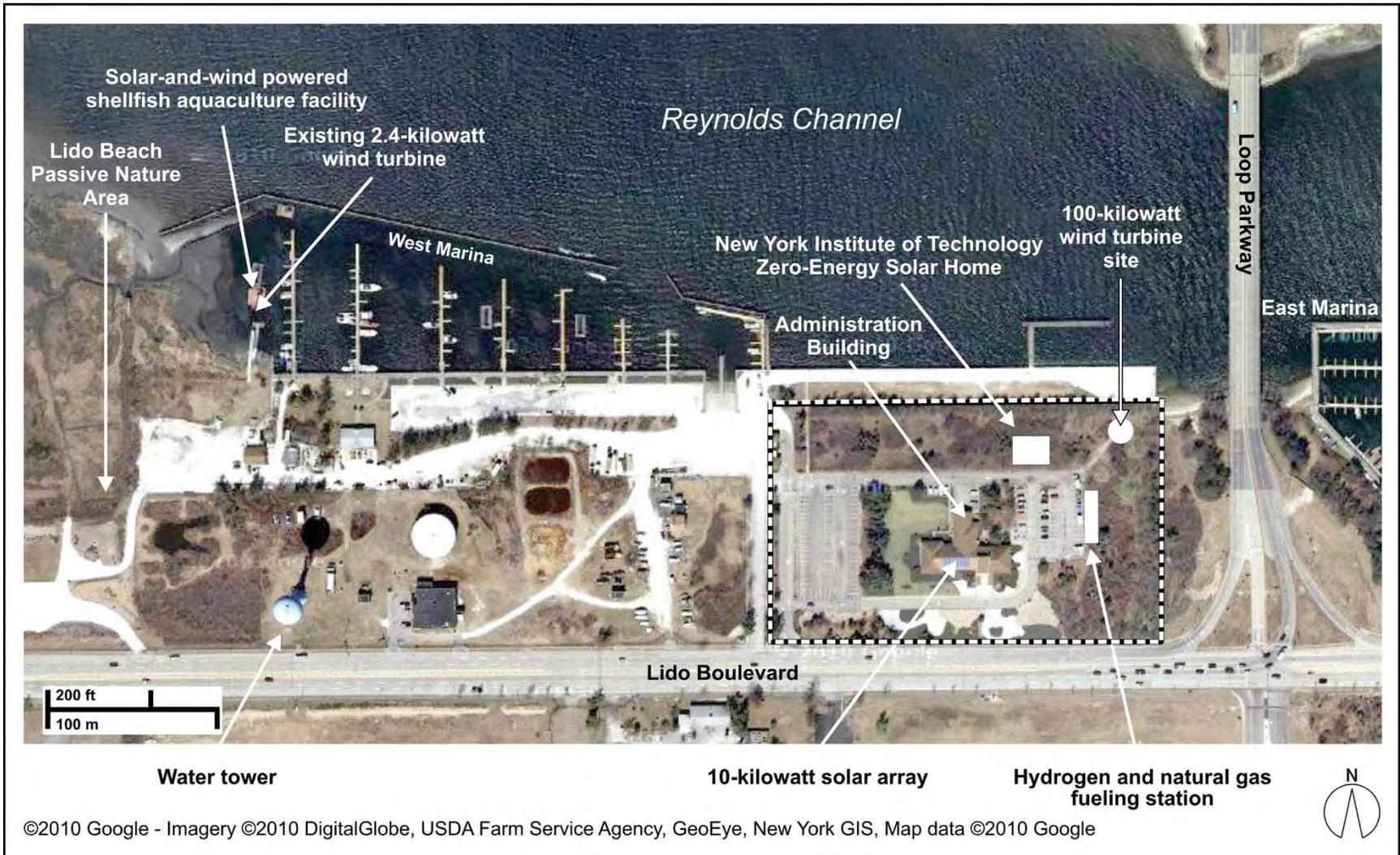


Figure 2-2. Clean Energy Project facilities and 4-acre proposed project site.

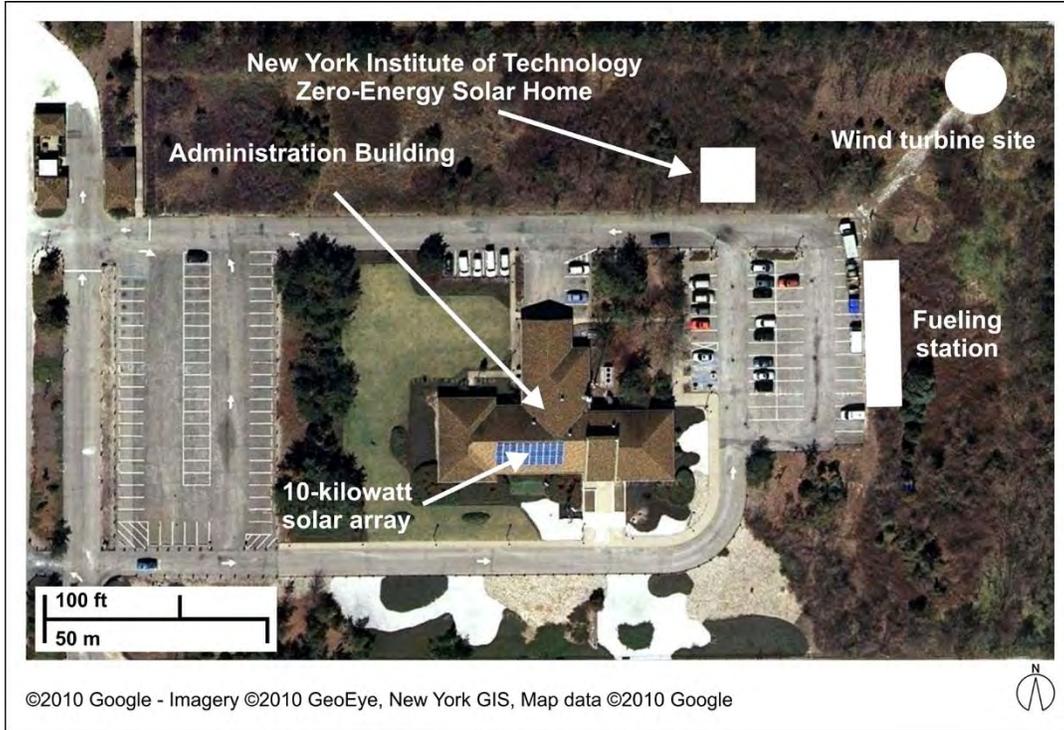


Figure 2-3. Closeup of proposed project area.

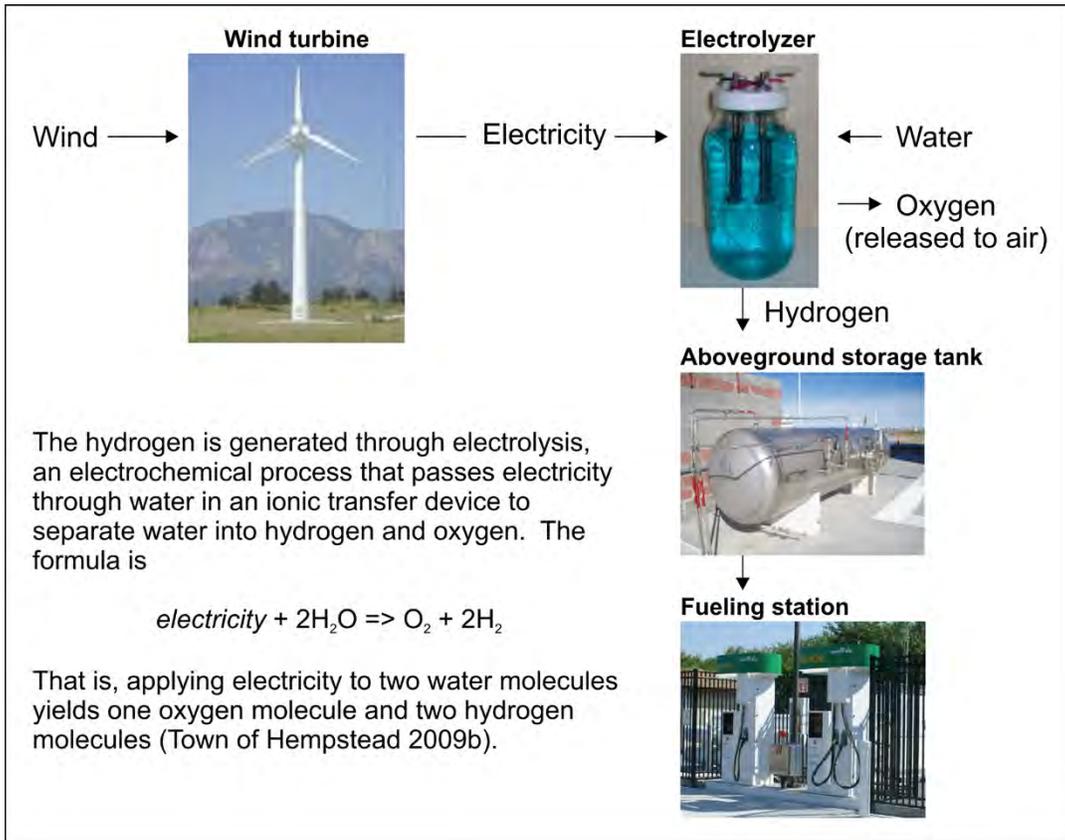


Figure 2-4. Schematic of conversion of wind power to hydrogen.

The Town has committed to certain “applicant committed measures” to avoid or minimize potential impacts during site preparation and installation:

- The Town would employ a licensed structural engineer to perform geotechnical studies to ensure proper siting and foundation design. If excavation for the turbine foundation and electrical line encountered groundwater, the Town would employ best engineering practices for exposure and removal of groundwater (dewatering) during construction. A structural engineer would design the foundation to prevent storm water or flooding from undermining foundation.
- If necessary, the Town would control soil erosion, sedimentation, and fugitive dust using best management practices such as watering disturbed areas.
- After construction, the Town would lay gravel over disturbed areas or revegetate some areas with native species.
- The Town would dispose of or recycle wastes under existing Federal, state, and local rules and regulations including spill prevention and mitigation measures.
- If construction unearthed archaeological materials or human remains during ground-disturbing activities, the Town would halt such activities, notify the New York SHPO and appropriate Indian Nations (Appendix A), and ask for direction on how to proceed.

Figures 2-5 and 2-6 are photographs that show the characteristics of the northeast corner in which the Town of Hempstead would construct the turbine. The area is vacant with no buildings or structures and is overgrown with vegetation including trees, shrubs, and scrub brush.



**Figure 2-5. Site of the proposed 100-kilowatt wind turbine.**



**Figure 2-6. Looking northeast toward the turbine site along access route.**

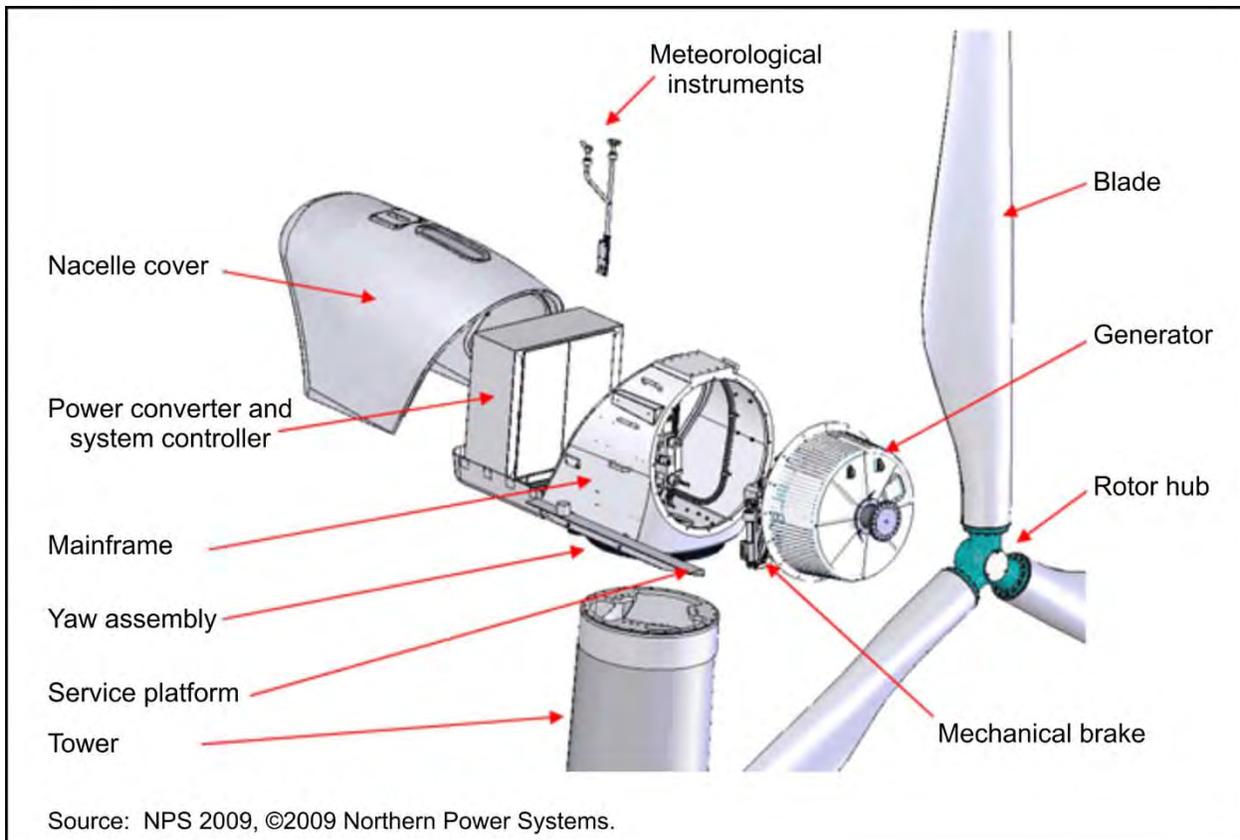
### **2.2.2 Wind Turbine Design and Siting Specifications**

The Town proposes to install a Northwind<sup>®</sup> 100 wind turbine, a product of Northern Power Systems (NPS 2008, 2009, 2010a,b; Lamonia 2010a). This turbine weighs about 23 tons and has a hub that would be about 122 feet above the ground. The turbine has three blades, each about 34 feet long. The diameter of the rotor, which consists of the blades and the rotor hub, is about 69 feet, so the tips of the blades would extend from about 96 to 156 feet above the ground. The tower for the Northwind 100 consists of three sections of tubular steel, and the nacelle cover and blades are fiberglass composite. Access to the tower is through a door at the tower base, which holds an electrical junction box that contains the power and control connection points, lockable power disconnect, and a basic control interface to secure the turbine for service. The tower has an internal ladder with a fall restraint system to provide access to the nacelle.

The turbine operates with a variable rotor speed ranging from 0 to 59 revolutions per minute. The turbine would start to generate electricity when wind speeds reached 7.8 miles per hour, and would stop at

56 miles per hour to prevent damage from higher wind speeds. It can withstand winds as high as 133 miles per hour. The turbine has dual braking capabilities. It uses a main shaft braking system that can be motor-applied for normal braking; the braking systems have fail-safes to ensure brake function in emergency conditions. The braking system is readily serviced from within the nacelle. In addition to the two mechanical brakes, the turbine includes an electrodynamic brake as part of the power converter assembly. The turbine can be stopped under any circumstances by using any two of the three brakes. The turbine conforms to all applicable wind turbine safety standards.

Figure 2-7 is a schematic of the Northwind 100. The rotor converts the aerodynamic energy in the wind to mechanical shaft torque, and it provides a lightning path from the blade tips to the main shaft. The generator converts the mechanical shaft power to electric power at variable frequency and provides the reaction torque to the rotor. The power converter converts the variable frequency generator output to constant frequency for feeding the electricity to the fueling station, including the electrolyzer, through a grid-tied mechanism. The system controller, which is inside the power converter cabinet, manages the normal operation of the turbine.



**Figure 2-7. Major components of the Northwind 100 wind turbine.**

The nacelle performs several functions and provides access to the service platform:

- The mainframe subsystem carries the mechanical rotor loads to the yaw assembly, which orients the machine into the wind and transfers mechanical loads to the tower.
- The nacelle cover protects the interior components (brake system, converter, and yaw drive).

- The meteorological instruments collect wind data for turbine control and monitoring.

The blades are fixed-pitch fiberglass-reinforced polyester that capture the wind, which turns the Y-shaped rotor hub and shaft. The turbine uses an advanced stall control technology, which is a function of the blade design, wind speed, and rotor speed, to achieve power limiting and control.

The turbine system includes the tower and foundation. The tower supports the turbine assembly in the wind stream and brings the mechanical loads to the foundation. The foundation transmits mechanical loads from the tower base to the ground.

The final location of the proposed turbine and the type of foundation depends on siting and geotechnical studies. A structural engineer would design the foundation for the exact location (Lamonia 2010a). The foundation would be steel-reinforced concrete and would be one of the following three types of foundation:

- A spread foundation would distribute the vertical loads over a broad area, and the mass of the footing itself would provide resistance against overturning. A spread footing would generally be square or octagonal. Depending on the strength of the soil, a spread footing could be between 23 and 36 feet across and anywhere from 3 to 7 feet thick.
- A deep monopile or caisson foundation would distribute the vertical loads over a smaller area and rely not only on the mass of the footing but also the strength of the surrounding soil to resist overturning. A caisson footing is generally round, about 10 feet in diameter, and from 15 to 25 feet deep. In strong soil, a monopile foundation generally contains the least amount of concrete and is often the most economical.
- A pile foundation would have timber, steel, or concrete piles a few to several feet thick and from 30 to 80 feet deep. A pile foundation would distribute the vertical loads both over the feet of the piles and along the pile sides. Friction along the pile surfaces would also provide resistance against overturning. This type is best for very soft soils with little bearing capacity. A piled foundation would have a cap about 3 feet thick and be 30 to 80 feet long by 20 to 35 feet across.

Construction would last up to about 5 weeks. Operation of the wind turbine would be via remote control and require about 2 weeks of maintenance activities per year. The turbine has a design lifespan of 20 to 40 years. At the end of its lifespan, the Town would consider whether to replace the turbine, retire the turbine and restore the site to more natural conditions, or use the site for another purpose.

## **2.3 Purpose and Need of Proposed Project**

The purpose of the proposed project is to facilitate use of renewable energy resources to power the Town's hydrogen and natural gas fueling station.

At present, the fuel station is powered by electricity the Town purchases from the local electric company. The proposed project would offset about 200,000 kilowatt-hours of electricity purchases. The proposed project would ultimately assist in the reduction of reliance on fossil fuels and facilitate the use of renewable energy resources. This use of wind energy directly supports the DOE goal of meeting more of America's energy demand with wind energy (DOE 2008).

The benefits of wind energy make it the second largest new energy resource for the U.S. electrical grid. Wind power is a renewable energy source that is both abundant and not depleted by use. Environmental benefits include the lack of harmful air emissions and lack of water consumption. The Town's proposed

project supports the DOE's Energy Efficiency and Renewable Energy mission to invest in clean energy technology, improve energy efficiency, and increase available domestic sources of energy (DOE 2010).

## **2.4 Alternatives**

### **2.4.1 DOE Alternatives**

The Towns' ARRA EECBG funds are from a formula grant, the amount is established pursuant to Title V, Subtitle E, Section 543, of the Energy Independence and Security Act of 2007 (Public Law 110-140; 121 Stat. 1492). Allocation of funds among eligible units of local governments, states, and Indian tribes is based on population and other factors. Recipients of these formula grants have broad discretion in how they use these funds as set forth by law and by EECBG guidelines.

In compliance with these regulations, this draft EA examines the potential environmental impacts of the DOE's Proposed Action (providing funding for the Proposed Project) and the No-Action Alternative. When complete, this EA will provide DOE with the information needed to make an informed decision about whether allowing the Town to use some of its Federal funds for the proposed project may result in significant environmental impacts. Based on the final EA, DOE either will issue a Finding of No Significant Impact (FONSI), which may include mitigation measures, or determine that additional study is needed in the form of a more detailed environmental impact statement.

### **2.4.2 No-Action Alternative**

Under the No-Action Alternative, DOE would not authorize EECBG funds for the construction and operation of the proposed project. As a result, the Town could delay the proposed project as it sought other funding sources or abandon the project if it could not obtain other funding. As a result, DOE's ability to achieve its objectives under the EECBG Program and the ARRA would be impaired.

Although the Town might proceed with the project if DOE did not authorize the expenditure of Federal funds, DOE assumes for the No-Action Alternative analyses in this EA that the proposed project would not proceed. This approach provides a basis for comparison of the impacts of the proposed project. If the Town did proceed without DOE's financial assistance, and assuming the scope of the project remained the same, the potential impacts would be essentially identical to those this EA identifies.

### **3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

This chapter of the Final EA describes the existing environmental, social, cultural, and economic conditions in the project area as well as the anticipated effects to these resources that could result from implementation of the proposed project and from the No-Action Alternative. The 4-acre proposed project area boundaries are the Loop Parkway to the east, the West Marina access road to the west, the marina walkway to the north, and Lido Boulevard to the south (Figure 2-2). Some of the described characteristics extend beyond these boundaries in order to capture corresponding impacts.

This chapter of the EA examines the potential environmental impacts of the proposed project for the following resource areas in detail:

- Water resources including floodplains and wetlands,
- Historic and cultural resources,
- Biological resources,
- Noise,
- Aesthetics and visual resources, and
- Occupational and public health and safety.

The focus of these more detailed analyses is on those environmental resource areas that could require new or amended permits, have the potential for impacts or controversy, or typically interest the public, such as occupational and public health and safety.

Section 3.8 discusses the impacts of the No-Action Alternative, under which DOE would not authorize EECSBG funds to design, permit, and construct a 100-kilowatt wind turbine and assumes the Town would not proceed with the proposed project.

#### **3.1 Environmental Resource Areas Not Carried Forward to Detailed Analysis**

Table 3-1 presents DOE's evaluations of additional resource areas that DOE commonly addresses in EAs. In an effort to focus the analyses on resource categories commensurate with their importance in relation to the proposed project, DOE limited the evaluations of these resource areas. This sliding-scale approach is consistent with NEPA [40 C.F.R. 1502.2(b)], under which impacts, issues, and related regulatory requirements are investigated and addressed with a degree of effort commensurate with their importance. DOE concluded that the proposed project would result in no impacts or minor impacts to the following resource areas and did not carry them forward for detailed description and analysis.

**Table 3-1. Environmental resource areas with no, small, or temporary impacts.**

Environmental resource area	Impact consideration and conclusion
Geology and soils	<p>The site of the proposed project is in Point Lookout, Nassau County, New York, at the east end of Long Beach Island, which lies between Reynolds Channel and the Atlantic Ocean (see Figure 2-1). The geology and soils at Point Lookout are typical of barrier islands in the northeast. The Town would conduct geotechnical studies before the installation of the proposed turbine to identify the optimum location on the project site and the specific requirements for foundation construction. There would be a short-term potential for soil erosion and sedimentation that the Town would control using best management practices. Impacts to soils would be small and temporary.</p> <p>Nassau County has performed a risk assessment of various natural hazards, which concluded that expansive soils, geomagnetism, and land subsidence were not “significant hazards” (Nassau County 2005). The report stated that earthquakes, hurricanes, and tornados are hazards even though they are rare in the region. Section 3.7 addresses natural hazards.</p>
Land use	<p>The proposed wind turbine location is in the northeast corner of a 4-acre parcel of Town property. The existing hydrogen and natural gas fueling station is collocated with the proposed project. This location is heavily vegetated, and there are no existing buildings or structures. The Town would clear the vegetation to provide access for a crane and other vehicles during construction of the foundation and installation of the tower and an underground electrical tie-in to the fueling station. The proposed turbine would have a concrete foundation. Installation would require a temporary crane pad of about 1,200 square feet and a temporary staging and construction laydown area of about 4,500 square feet. After construction, the Town would lay gravel over the disturbed areas.</p> <p>Land use in the general area includes two marinas, a passive nature preserve, soccer fields, and a water tower. There is a 2.4-kilowatt wind turbine and two 5-kilowatt solar arrays that support a shellfish farm nearby, and the 4-acre site contains a demonstration solar home and the Administration Building with a 10-kilowatt solar array. The wind turbine, the fueling station, and the solar facilities are part of the Town’s overall Clean Energy Project. The proposed project would be consistent with the existing land uses in the immediate vicinity, which support local government operations and Clean Energy Project facilities. Impacts to land use would be minimal.</p>
Air quality	<p>The New York Department of Environmental Conservation has ambient air monitoring systems at Eisenhower Park in Nassau County and at two locations in Suffolk County. These sites monitor for carbon monoxide, ozone, sulfur dioxide, inhalable particulate matter, lead, nitrogen oxide, nitrogen dioxide, and the combination of the latter two as total nitrogen oxides (Nassau County 2010a). At present, Nassau County is in nonattainment with National Ambient Air Quality Standards for two of the six criteria pollutants, particulate matter with aerodynamic diameter of 2.5 micrometers or less and ozone (EPA 2010).</p> <p>The proposed project would have no emissions and would not require air quality permits. Small, temporary air quality impacts would occur during construction and installation from emissions from the crane, delivery trucks, and other construction equipment. The Town would control fugitive dust by watering the construction area if necessary.</p> <p>Once in operation, the proposed project would generate about 200,000 kilowatt-hours per year of electricity to run the hydrogen conversion process and fueling station. That electricity would replace electricity the Town currently buys from the grid, most of which comes from conventional fossil-fuel power plants. There would be no adverse impact to air quality during operations, and the replacement of electricity from fossil fuel power plants would not contribute to climate change.</p>

**Table 3-1. Environmental resource areas with no, small, or temporary impacts (continued).**

Environmental resource area	Impact consideration and conclusion
Socioeconomics	<p>Socioeconomics is the study of the interrelation between social and economic factors. These factors include demographics, employment, and income. Nassau County has a large metropolitan population of about 1.4 million residents. The proposed project would not result in a change to the population as a result of construction, installation, or operations. The county has a very large employment base of nearly 840,000 jobs in a well-diversified economy. The proposed project would not result in any permanent new positions but could result in temporary jobs for construction and installation. The proposed project would not create new positions during operations. The Town would hire contractors to perform monitoring and maintenance responsibilities for the turbine. The 2008 per capita income of \$65,700 in Nassau County was about 135 percent of that in the State of New York. There would be no project-related changes in population, employment, or wages. Most intermediate goods and services would be purchased outside the county. Therefore, the per capita income in Nassau County would not be affected by project-related activities. The proposed wind turbine project would not change regional population, employment, or personal income. Therefore, there would be negligible impacts to the socioeconomic variables (Baxter 2010).</p>
Environmental justice	<p>Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” directs Federal agencies to address environmental and human health conditions in minority and low-income communities. The evaluation of impacts to environmental justice is dependent on determining if high and adverse impacts from the proposed project would disproportionately affect any low-income or minority group in the affected community.</p> <p>In 2008, the aggregate percent of all racial minorities (Black, American Indian or Alaskan Native, Asian, Native Hawaiian or other Native Islander, or persons of two or more races) was 20 percent in Nassau County. Persons of Hispanic or Latino origin made up about 13 percent of the population in Nassau County. In 2008, about 4.9 percent of the residents in Nassau County lived below the poverty level (Baxter 2010).</p> <p>The proposed project would not have adverse impacts on population, employment, or income for any population group in Nassau County including residents of a minority race, minority ethnicity, or who are low income. In addition, DOE has determined in this EA that there would be no adverse impacts to any resource area from the proposed project. Therefore, there would be no high and disproportionate impacts to any minority, ethnic, or low-income population.</p>
Public services	<p>As described above, the proposed project would not result in discernable increases in direct or indirect employment from construction, installation, or operations. Therefore, there would be no associated immigration or additional pressure on public services, including educational services and housing availability (Baxter 2010).</p> <p>Section 3.7 discusses potential occupational and public health and safety impacts and examines natural phenomena that could damage the proposed turbine and lead to further impacts. If any of those occurred, the availability of first responders and medical services would be important. There are 12 hospitals in Nassau County with about 4,200 staffed beds. More than 10,000 physicians serve the community. Nassau County has about 3,500 law enforcement employees of whom about 2,700 are law enforcement officers. There are 65 fire departments in the county with 160 stations. There are about 130 career firefighters, more than 8,000 volunteer firefighters, and about 400 support personnel (Baxter 2010).</p> <p>There would be negligible impacts to public services.</p>

**Table 3-1. Environmental resource areas with no, small, or temporary impacts (continued).**

Environmental resource area	Impact consideration and conclusion
Waste and hazardous materials	<p>Construction and installation would generate debris including equipment packaging materials, small amounts of excavated soil, solvents, gasoline, oils, and other lubricants. The Town would manage these wastes under the existing local practices including spill prevention and mitigation measures.</p> <p>Once in operation, periodic maintenance of the proposed turbine would generate small quantities of lubricants and cleaning materials, which the Town would recycle or dispose of consistent with local, state, and Federal regulations.</p> <p>There would be no or minimal waste and hazardous materials impacts.</p>
Utilities, energy, and materials	<p>The Long Island Power Authority is a nonprofit municipal electric utility that owns the retail electric system on Long Island and provides service to about 1.1 million customers in Nassau and Suffolk Counties and the Rockaway Peninsula in Queens County.</p> <p>The Town currently buys the electricity to run the fueling station from the power authority. The proposed project would generate about 200,000 kilowatt-hours of electricity each year to support the fueling station, which would offset electricity from conventional sources such as fossil fuel plants.</p> <p>Because the proposed project would not require water for operations and would not generate wastewater, there would be no impacts to local water utilities or infrastructure.</p> <p>Materials for the construction and installation of the proposed turbine would include small amounts of water for dust suppression and other construction uses, petroleum products for construction equipment, and small amounts of other materials such as gravel and concrete.</p> <p>There would be no or minimal impacts to utilities, energy, and materials.</p>
Transportation	<p>Nassau County has an extensive transportation infrastructure. The roads and highways in Nassau County include Interstate Highway 95. Construction would involve a few deliveries and worker commutes to the site. Operation would not cause increased traffic. Therefore, the proposed project would have no impact on new public road construction or increased road maintenance.</p> <p>The proposed project area is easily accessed from Lido Boulevard and the existing parking lot at the Administration Building. The vendor would deliver the proposed turbine and its components in two truck shipments. For installation, a 100-ton crane and other construction vehicles would require access to the site. The installation and operation of the proposed project would have no impact to the level of transportation services in the area of the site. There could be temporary impacts to parking at the Administration Building during construction.</p> <p>There would be negligible impacts to transportation.</p>

## 3.2 Water Resources

This section addresses surface water, floodplains and wetlands, and groundwater resources. It provides the information necessary to meet DOE’s obligations under 10 C.F.R. Part 1022, “Compliance with Floodplain and Wetland Environmental Review Requirements.”

### 3.2.1 Affected Environment

#### Surface Water

The Town’s proposed site is in the Atlantic Ocean/Long Island Sound watershed (lighter area in Figure 3-1), which drains the New York City metropolitan area and all of Long Island in the southeast

corner of the State of New York. The drainage area encompasses all marine waters in New York Harbor, Long Island Sound, Block Island Sound, the South Shore of Long Island, and the waters that drain into them. The basin includes about 1,700 square miles of land area. The basin drainage area includes all of Kings (Brooklyn), Nassau, New York (Manhattan), Queens, Richmond (Staten Island), and Suffolk counties, most of Bronx County, and a portion of southern Westchester County (NYDEC 2010b).



**Figure 3-1. Atlantic Ocean/Long Island Sound watershed.**

The surface water resources of the Atlantic Ocean/Long Island Sound Basin are dominated by the estuary and marine waters that cover about 910,000 acres (about 1,400 square miles). There are about 552 miles of freshwater rivers and streams and 132 freshwater lakes, ponds, and reservoirs (about 6,700 acres) in the basin. The Atlantic coastline stretches for approximately 118 miles from Rockaway Point at New York Bay to Montauk Point in Eastern Suffolk County at the furthest northeastern tip (South Fork) of Long Island (NYDEC 2002). The nearest permanent surface water to the proposed project site is Reynolds Channel approximately 200 feet north. Reynolds Channel is an east-west trending strait that separates Long Beach Island from numerous other estuary-bounded islands to the north. The shoreline of Reynolds Channel, at the closest point to the proposed project site, consists of engineered pilings, piers, walkways, and fill material.

### ***Floodplains and Wetlands***

**Floodplains.** Consistent with the marshy and estuarine topography of the area, the surface water features of primary concern are the floodplains and wetlands that are extensive throughout this area. Because of its location in Long Island's coastal zone near large areas of marsh and wetlands, the proposed project would be located in a floodplain. The Federal Emergency Management Agency (FEMA) produces Flood Insurance Rate Maps that cover most of the United States and identify areas that might be prone to flooding. The maps generally show the extent of flooding for a 100-year flood. A 100-year flood has a 1-percent chance of occurring in any given year. On average, a flood of this magnitude, or greater, is likely to occur once within any 100-year period. Figure 3-2 shows the areas a 100-year flood would inundate.

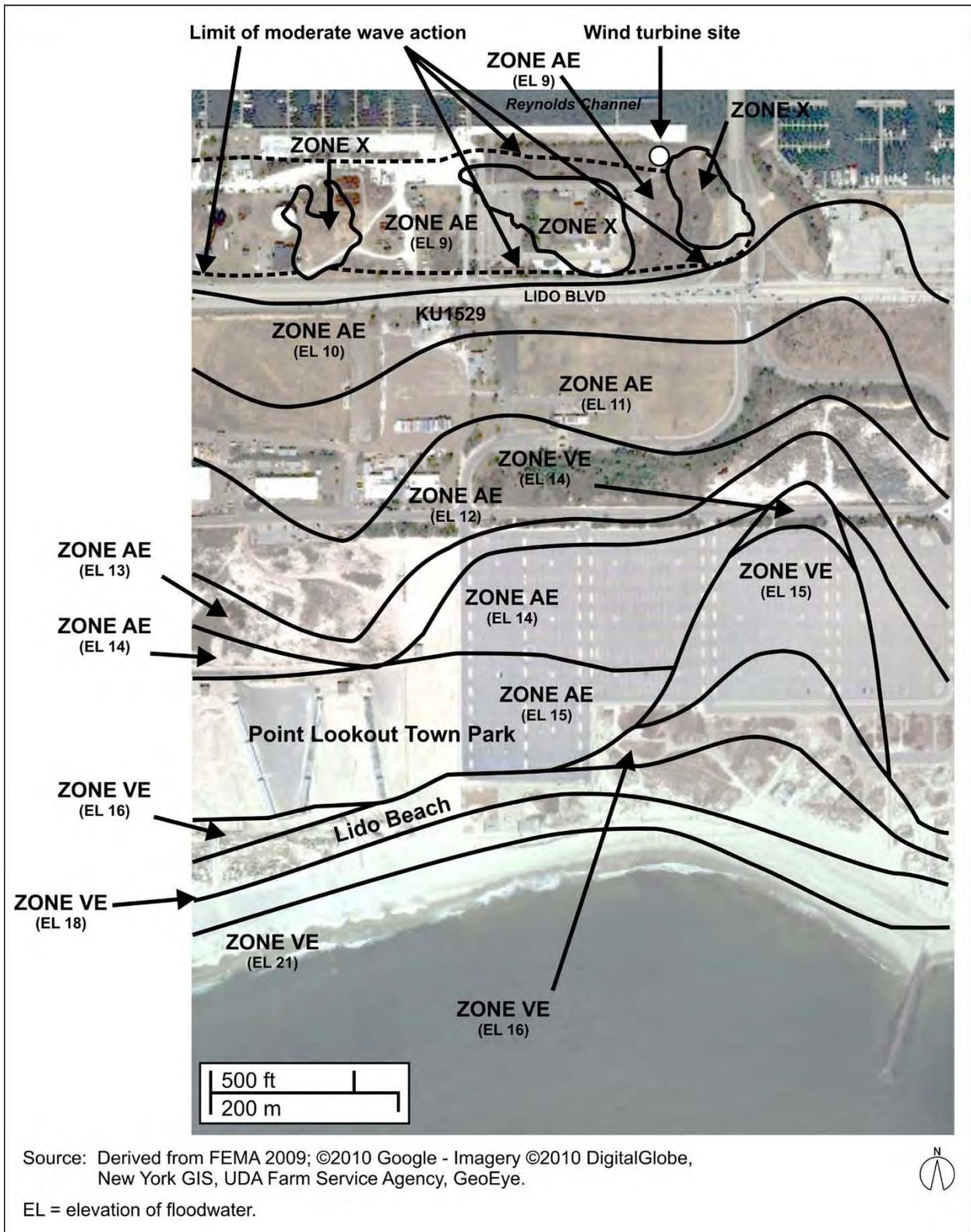


Figure 3-2. Inundation areas for a 100-year flood.

The zones in the figure represent the following effects, and the map includes elevations of the 100-year floodwaters in feet above mean sea level:

- Zone AE – A 100-year flood would inundate these areas.
- Zone VE – Not only would a 100-year flood inundate these areas, but they would also be subject to wave action velocity hazard because they are coastal zones.
- Zone X – A 100-year flood would not affect these areas.

The map divides the Zone AE areas with a limit of moderate wave action, which represents the approximate landward limit of a 1.5-foot breaking wave. The effects of wave hazards between Zone VE and the limit would be similar to, but less severe, than those in Zone VE. In addition, the entire project area is part of the John H. Chafee Coastal Barrier Resources System, which is part of a system of naturally protected coastal areas (such as barrier islands). As Figure 3-2 shows, the analyzed site for the proposed turbine would be within the limit of moderate wave action in Zone AE at an elevation of about 9 feet and very close to a Zone X area that would not flood.

**Wetlands.** The closest wetlands to the proposed project area consist of the saltwater Reynolds Channel, which is about 100 feet north, a maintained field that retains water during periods of heavy rainfall, and two bermed freshwater settlement ponds. The field and settlement ponds are about 1,000 and 1,500 feet east of the proposed turbine site, respectively. Figure 3-3 is a map of wetlands in the general area of the proposed site.



**Figure 3-3. Wetlands in the vicinity of the proposed site.**

The codes in the figure, defined by FWS (for example, E1UBL and PEM1C), identify the types of wetlands, which are represented by the different shadings:

- E1UBL – Estuarine (in the transition zone between river and ocean environments), subtidal (always below water) area with unconsolidated bottoms;
- E1ABIL – Estuarine (in the transition zone between river and ocean environments), subtidal (always below water), aquatic bed (wetlands and deep-water habitats with plants growing on or below the water surface), algae present;
- E2EM1Pd – Estuarine (deep-water tidal habitats and adjacent tidal wetlands along low-energy coastlines), intertidal (area between extreme low water and extreme high water), emergent (upright, rooted, herbaceous water plants present most of the growing season), irregularly flooded and partially drained or ditched;
- E2EM1N – Estuarine (deep-water tidal habitats and adjacent tidal wetlands along low-energy coastlines), intertidal (area between extreme low water and extreme high water), emergent (upright, rooted, herbaceous water plants present most of the growing season), regularly flooded;
- PEM1C – Palustrine (nontidal wetlands dominated by marshes and swamps) area that is seasonally flooded or saturated, emergent (upright, rooted, herbaceous water plants present most of the growing season); and
- PUBHx – Palustrine (nontidal wetlands dominated by marshes and swamps) area that is seasonally flooded or saturated, unconsolidated bottom, permanently flooded, excavated.

### **Groundwater**

Long Island aquifers receive their fresh water from precipitation (rain and snow), which averages about 44 inches a year. About half of this percolates into the ground and recharges the groundwater system (CCE 2010). The remaining precipitation evaporates, is taken up by plants, or runs off into creeks, bays, and estuaries. Streams, ponds, and wetlands form in areas where the water table rises to the ground surface.

There are three major aquifers in Nassau County that provide large amounts of groundwater to its communities: the Upper Glacial aquifer, the Magothy aquifer, and the Lloyd aquifer (NYDEC 2010c). All three aquifers are present beneath the proposed project area. The aquifers in the project area are considered sole source aquifers, which are designated by EPA as the sole or principal source of drinking water for an area. Although mixing between aquifers is possible, groundwater flow on Long Island is generally in an easterly direction.

The Upper Glacial aquifer is an unconfined aquifer and directly underlies the ground surface; it consists of sand, pebbles, rocks and boulders. There are no drinking water production wells in this aquifer for the communities in the project area, but water monitoring wells in Point Lookout show the water table is only a few feet beneath the surface.

The Magothy aquifer consists of alternating sands and clays and is the largest aquifer that underlies Long Island. It supplies over 90 percent of the water to Nassau County communities (CCE 2010). The aquifer ranges from 0 to 600 feet below ground and is about 1,100 feet thick at its maximum (NYDEC 2010c).

The Lloyd Aquifer is the deepest and oldest of Long Island's aquifers. It is a sand and gravel formation and ranges in thickness from 0 to 500 feet. At its deepest, it is 1,800 feet below the surface. There are three water production wells in the deep Lloyd aquifer that provide water for the communities around the project location.

### **3.2.2 Environmental Consequences of the Proposed Project**

#### ***Construction Impacts***

Potential surface water impacts during construction activities such as excavation of soils could result from increased runoff of sediment into the nearby Reynolds Channel during extensive precipitation events. The proposed turbine site is approximately 9 feet above the water level in the channel and would provide for preferential drainage toward the water. Any impacts to Reynolds Channel would be temporary and minor. With proper management of hazardous materials during construction (for example, solvents and lubricants), the potential for contamination of nearby surface waters would be negligible. Potential construction impacts to the nearby maintained field and settlement ponds would also be negligible because of the distance from the project site (1,000 to 1,500 feet) and because the ponds have berms around them.

Although the construction zone for the proposed project would be in the 100-year floodplain and within the limit of moderate wave action, the type of construction and short duration of activities (a few weeks) would be unlikely to modify the flooding characteristics of the area. In addition, and again because of the short duration, the chance that a 100-year flood could affect construction activities would be small.

Due to the shallow water levels in the Upper Glacial aquifer, excavation for the turbine foundation and electrical line could encounter groundwater, which would require the employment of best engineering practices for exposure and removal of groundwater (dewatering) during construction. Although the Upper Glacial aquifer is a designated sole source aquifer, it is not used to provide water in the area. Therefore, impacts to this aquifer from construction activities would be negligible. Because the Magothy and Lloyd aquifers are not near the surface in the proposed project area, there would be no impacts to these aquifers from surface construction and the excavations for the turbine foundation and underground electrical line.

#### ***Operations Impacts***

Impacts to surface waters and wetlands during operations would be minimal. The proposed project would create more runoff in comparison with the existing soil areas, but the size of the affected area would be limited (see Section 2.2.2) and the relative flatness in the immediate vicinity would minimize runoff potential. The proposed project location is not in any delineated wetlands, and operations would not cause surface water contamination.

The proposed project would occur in the 100-year floodplain and within the limit of moderate wave action. FEMA's estimated elevation level of floodwaters at the proposed location during a 100-year flood is about 9 feet. According to 10 C.F.R. Part 1022, a floodplain assessment must be completed to evaluate flood hazards and floodplain management for proposed actions in a floodplain. The project description in Chapter 2 and the following information satisfies the requirement for a floodplain assessment.

The Town would install the proposed turbine on a concrete pad at a height equal to or slightly above the existing ground surface. To minimize modification of the floodplain, a structural engineer would design the foundation to prevent storm water or storm surges from undermining the tower. The presence of this relatively small concrete structure would cause no detectable change in flood elevations, and the pad and

turbine tower would not obstruct the flow of flood water. Therefore, the installation and operation of the proposed project would have no or negligible adverse impacts on the natural and beneficial values of the floodplain. The proposed project would not alter the frequency or severity of flooding such that there would be adverse effects or greater risk to people or property. Because the proposed project would not result in adverse impacts or incompatible development within a floodplain, DOE did not consider alternative locations or design considerations.

The Upper Glacial aquifer is not a drinking water supply for the communities near the proposed project site. Discharges of contaminants during operation of the proposed project would not be likely. Therefore, impacts to the water quality of the Upper Glacial aquifer would not be likely. The Town would have a spill prevention and mitigation plan in place. Because the Magothy and Lloyd aquifers are not near the surface in the proposed project area, there would be no potential impacts to these groundwater resources from project operations.

### **3.3 Historic and Cultural Resources**

Cultural resources are archaeological sites, historical structures and objects, and traditional cultural properties. Historic properties are cultural resources that are listed in or eligible for listing in the NRHP because they are significant and retain integrity (36 C.F.R. 60.4). Section 106 of the National Historic Preservation Act (16 U.S.C. 470 et seq.) requires that Federal agencies take into account the effects of their actions on historic properties. Section 101(b)(4) of NEPA requires Federal agencies to coordinate and plan their actions to identify any unique historic or cultural characteristics of the geographic area (40 C.F.R. 1508.27) of the proposed project and act accordingly. The first step of the process is for an agency to determine whether an action is an undertaking [36 C.F.R. 800.3(a)]. The proposed project is an “undertaking” because it is “a project, activity, or program funding in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval” [36 C.F.R. 800.16(y)].

The regulations at 36 C.F.R. Part 800, “Protection of Historic Properties,” describe the process for compliance with Section 106, including defining the area of potential effect (APE), steps to identify resources, evaluate effects, and consultation with interested parties including the SHPO and other concerned parties. The regulations state, “If the undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties are present, the agency official has no further obligations under section 106, or this part” [36 C.F.R. 800.3(a)(1)]. By definition, an “effect” is an “alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register” [36 C.F.R. 800.16(i)].

The following section describes the existing historic and cultural resource conditions in the area of the proposed project site. The APE for cultural resources includes the direct APE, which is the area that could be disturbed by construction activities and the indirect APE, which includes those historic or eligible sites from which the proposed project could be seen, within one-half mile of the proposed project.

According to regulations on the protection of historic properties [36 C.F.R. 800.5(a)(2)(v)], an adverse effect can include “introduction of visual, atmospheric, or audible elements that diminish the integrity of the property’s significant historic features.” A project can have adverse visual effects by involving either a negative aesthetic or obstructive effect on historic properties. An obstructive effect is one that diminishes the historic property’s integrity by blocking the property from view or by blocking the view from the property.

### 3.3.1 Affected Environment

DOE conducted a review of the New York SHPO historic preservation database for the presence of previously identified cultural resources in or adjacent to the project area. The review identified the proposed project location to be next to (west of) a portion of the Jones Beach State Park, Causeways, and Parkways System (shaded area), which was listed on the NRHP in February 2005 (Figure 3-4). The entire Jones Beach System encompasses 10,000 acres and includes 22 buildings, 6 sites, and 33 bridges and causeways that have contributing historic features. The system represents one of the country’s most spectacular beach networks, notable for its immense size, engineering and design, and ability to provide public recreation on a large scale (NYSHPO 2005). The specific portion of the system that borders the proposed project area is the north-south Loop Parkway bridge (and adjacent buffer), which was built in 1934 and crosses the Reynolds Channel. The transportation system of the Jones Beach System was included in the NRHP nomination because it provides essential components of access.



**Figure 3-4. Historic and cultural resources in the project area.**

The database lists an unidentified archaeologically sensitive area about 0.5 mile south of the proposed project location, just offshore along the beach (NYSHPO 2010). The historic resource associated with the sensitive area appears to be an unknown tugboat wreck site. A geographically large, archaeologically sensitive area about 1.5 miles north of the project site covers numerous inlets, estuaries, and marshes. The area extends in a broad east-west swath and provides protection for numerous archaeological sites associated with early American Indian inhabitants along the tidal marshes and adjacent land. The next

closest cultural resources consist of three historic homes, a post office, and a commercial property 3.5 miles west in the Town of Long Beach. The NRHP lists these properties.

The Shinnecock Indian Nation, a Federally recognized tribe, and the Unkechaug Indian Nation of Poospatuck Indians, a New York-recognized tribe, have lands toward the eastern end of Long Island and have cultural and historic ties to the broader region. Two additional Federally recognized tribes, the Delaware Tribe located in Kansas and the Delaware Nation of Oklahoma, have historic and cultural ties to the Long Island area and have expressed an interest in development projects that could affect cultural resources in the area.

### **3.3.2 Environmental Consequences of the Proposed Project**

The proposed project footprint (tower foundation with border, access route, and underground electrical line), the crane pad, and the construction staging and laydown areas are considered the proposed project's direct APE. The indirect effects of the proposed project on the APE addresses a larger area (within one-half mile) for potential visual impacts to historic properties in the area.

#### ***Construction Impacts***

Because the site of the proposed project is near or adjacent to estuaries, marshlands, and bays, it is likely that American Indians used the area to some extent before the arrival of Europeans. The 4-acre parcel has been previously disturbed for Town facilities. The northeast corner is undeveloped. The presence of archaeological sites within the direct APE is unlikely, and DOE knows of no evidence of artifacts in the footprint of the potential construction area (about 4,500 square feet). If construction unearthed archaeological materials or human remains during ground-disturbing activities, the Town would halt such activities, notify the New York SHPO, and ask for direction on how to proceed.

A boundary of the Jones Beach State Park, Causeways, and Parkways System is immediately adjacent to the APE. However, the border is fenced and no construction activities would occur outside the property line. Therefore, no direct construction impacts would occur to the Jones Beach System. Construction activities would not affect the archaeologically sensitive tugboat wreck location south of the project site, the sensitive area to the north, or the historic structures in the Town of Long Beach. The construction of the proposed project would have no effect to any known historic properties or cultural resources.

#### ***Operations Impacts***

Other than possible indirect visual impacts to historic or cultural resources, no other effects would occur.

Once in operation, the proposed project would be a vertical visual presence in the community (see the figures in Section 3.6). The proposed project would be adjacent to the Jones Beach State Park, Causeways, and Parkways System, a NRHP-listed property. The turbine would be visible from multiple locations in the Jones Beach System, with the closest location being the fence line of the wind turbine site by the Loop Parkway bridge to the east. Historic buildings and other structures in the system are several miles away on the adjacent barrier island to the east. Because the property adjacent to the proposed project site is a geographic land area and bridge crossing Reynolds Channel and does not represent a typical historic resource such as an architecturally significant home, building, structure, or other object, DOE concluded that visual impacts on this historic property would be unlikely.

There are many other tall structures visible in the proposed project area including a 190-foot water tower, several communication towers, weather towers, a traffic camera tower, flagpoles, and an existing 45-foot wind turbine that powers the Town of Hempstead's shellfish farm. Therefore, the proposed wind turbine

would not represent a substantially different visual presence to or from any historic resources in the area, including the homes and other buildings in the Town of Long Beach, which are 3.5 miles away.

Although there are some historic and cultural resources nearby, DOE has determined that operation of the wind turbine would cause no effect to historic or cultural resources in the Point Lookout area.

## 3.4 Biological Resources

### 3.4.1 Affected Environment

The site of the proposed project is between marshlands and beach sand dunes. Directly south of the site is Point Lookout Town Park. To the immediate west is Malibu Town Park. About one-half mile to the west is Lido Beach Passive Nature Area, and farther west is the U. S. Fish and Wildlife Service's Lido Beach National Wildlife Refuge. This section focuses on special-status species, which are federally threatened and endangered species as well as species the State of New York recognizes as threatened, endangered, rare, or of special concern in the area of the proposed project.

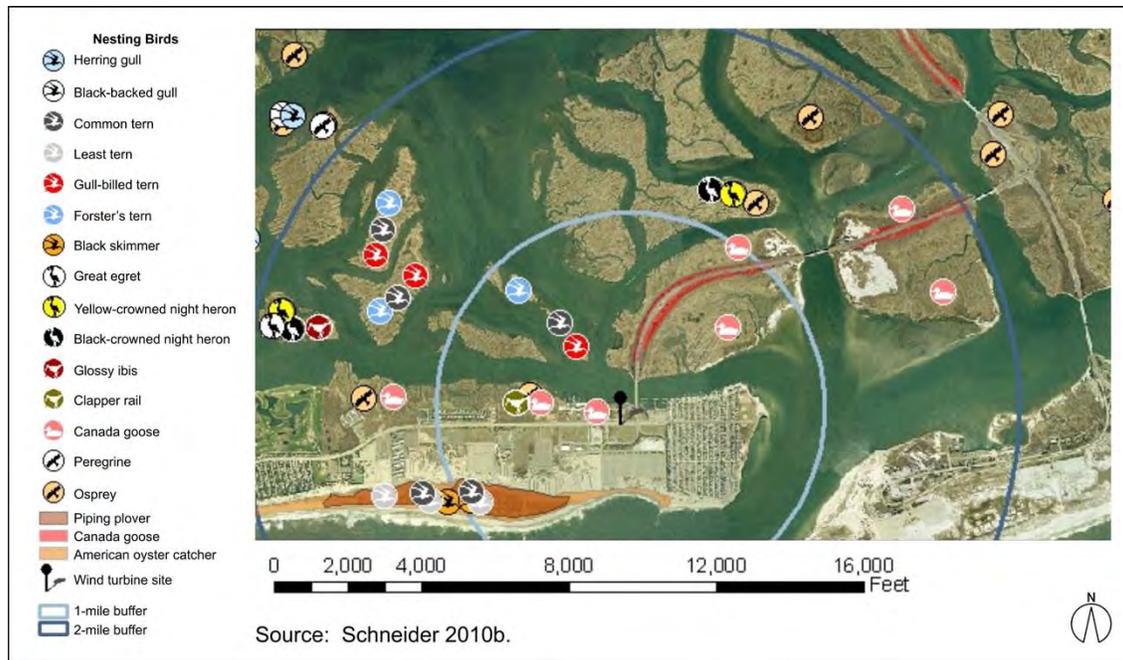
The Lido Beach Passive Nature Area encompasses 40 acres of tidal wetlands and an upland area that many avian species use. These include the Federally protected piping plover (*Charadrius melodus*) and bald eagle (*Haliaeetus leucocephalus*) (FWS 2010b), and State of New York protected and special concern species including the peregrine falcon (*Falco peregrines*), pied-billed grebe (*Podilymbus podiceps*), Northern harrier (*Circus cyaneus*), common tern (*Sterna hirundo*), least tern (*Sterna antillarum*), little blue heron (*Egretta caerulea*), glossy ibis (*Plegadis falcinellus*), laughing gull (*Leucophaeus atricilla*), gull-billed tern (*Gelochelidon nilotica*), and Forster's tern (*Sterna forsteri*) (NYDEC 2010d). The nature area is about one-quarter mile from the proposed site.

Lido Beach National Wildlife Refuge, which is part of the Long Island National Wildlife Refuge Complex, is on the bay side of Long Beach Island. The refuge is almost entirely tidal wetland, with 22 acres of salt marsh and shrub thickets. It supports a wide diversity of wading and shore birds, and nesting habitat for clapper rails (*Rallus longirostris*), black-crowned night heron (*Nycticorax nycticorax*), osprey (*Pandion haliaetaetus*), and saltmarsh sharp-tailed sparrow (*Ammodramus caudacutus*). The refuge is also home to a variety of wintering waterfowl.

The Atlantic coast supports a variety of resident and migratory marine and coastal birds. Many are likely to occur in the project area. Commonly occurring bird species include herring gull (*Larus argentatus*), greater black-backed gull (*Larus marinus*), yellow-rumped warbler (*Dendroica coronate*), and American crow (*Corvus brachyrhynchos*).

Figure 3-5 shows nesting bird species that have been observed in the general area of the proposed project. The blue lines indicate 1- and 2-mile radii around the proposed site. There are no species that nest on or adjacent to the proposed project site. Most species nest further inland on islands in Middle Bay. The majority of birds nest more than 1 mile from the site.

As part of the Town's stewardship efforts for the adjacent Lido Beach Passive Nature Area, it conducted weekly surveys of the species of birds there from July 2005 through December 2006. The surveys noted 108 species of birds (Schneider 2010a). Although these birds have not been observed at the site, some of these birds could fly near the site, given its location on an access-restricted, barrier-beach peninsula along



**Figure 3-5. Nesting bird species near Point Lookout.**

an inlet between the Atlantic Ocean and a large, productive coastal bay. The weekly observations did not note any bats. The lack of mortality at the existing wind turbine supports the Town’s observations that birds and bats do not utilize the vicinity of the proposed project.

Many raptors hunt and forage along coastlines; these include the Northern harrier, osprey, and peregrine falcon, which are protected under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) and the bald eagle, which is protected under the Bald and Golden Eagle Protection Act, as amended (16 U.S.C. 668 et seq.).

No special-status species of marine mammals are known to breed in the proposed project area, although several turtle species have used New York coastal waters during the summer and early fall. These include the threatened loggerhead (*Caretta caretta*) and the endangered Kemp’s ridley (*Lepiduchelys kempi*), leatherback (*Dermochelys coriacea*), and green (*Chelonia mydas*) turtles. One insect species in the area, the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*), is Federally listed as threatened. There are no special-status mammals in the area of the proposed project.

### **Protected Bird Species**

Two Federally protected bird species might occur in the area—the endangered roseate tern (*Sterna dougallii dougallii*) and the threatened piping plover (*Charadrius melodus*). The Town’s weekly observations from July 2005 through December 2006 observed neither the roseate tern or the piping plover at the Lido Beach Passive Nature Area (Schneider 2010a). Figure 3-6 shows these birds.

The roseate tern is a marine coastal bird that breeds along the Atlantic Coast on salt marsh islands and beaches with sparse vegetation. In New York, these birds breed only at a few Long Island colonies. The largest colony, more than 1,000 pairs, is at Great Gull Island off eastern Long Island (NYDEC 2010e). Piping plovers breed on dry sandy beaches or in areas that have been filled with dredged sand, often near dunes in areas with little or no beach grass. In New York, these birds breed on Long Island’s sandy beaches from Queens to the Hamptons and in the eastern bays and harbors of northern Suffolk County



**Figure 3-6. Endangered roseate tern and threatened piping plover.**

(NYDEC 2010f). The piping plover has occurred on the Atlantic Ocean beaches about 0.75 mile from the proposed project (Figure 3-5). Piping plovers do not breed at the Lido Beach Passive Nature Area. They may use this site as a foraging area, but it does not contain primary foraging habitat.

The Bald and Golden Eagle Protection Act prohibits anyone, except under permit from the Secretary of the Interior, from taking bald or golden eagles, their eggs, nests, or any other parts of the birds. There have been no observations of the golden eagle or the bald eagle at the Lido Beach Passive Nature Area or the proposed project site. There are no bald or golden eagle nests in the general area of Point Lookout and Middle Hempstead Bay.

Several bird species in the vicinity of the proposed project are protected by New York State law. Table 3-2 lists the state-protected birds that were observed at the Lido Beach Passive Nature Area from July 2005 through December 2006 (Schneider 2010b).

**Table 3-2. New York protected bird species seen at Lido Beach Passive Nature Area.**

Common Name	Scientific Name	Days Observed	Individual Birds Observed
<b>Endangered</b>			
Peregrine falcon	<i>Falco peregrinus</i>	7	5
<b>Threatened</b>			
Common tern	<i>Sterna hirundo</i>	3	38
Least tern	<i>Sterna antillarum</i>	9	27
Northern harrier	<i>Circus cyaneus</i>	1	1
Forster's tern	<i>Sterna forsteri</i>	7	46
Glossy ibis	<i>Plegadis falcinellus</i>	11	35
Great egret	<i>Ardea alba</i>	26	37
Laughing gull	<i>Leucophaeus atricilla</i>	15	48
Snowy egret	<i>Egretta thula</i>	17	20
<b>Special concern</b>			
Black skimmer	<i>Rynchops niger</i>	16	192
Osprey	<i>Pandion haliaetus</i>	27	71
Seaside sparrow	<i>Ammodramus maritimus</i>	11	unknown

### **Protected Plant Species**

Table 3-3 lists the three Federally protected plants in the area. Appendix B lists plants that the State of New York has determined to be endangered, threatened, and rare, respectively, pursuant to

Sections 3-0301, 9-0105, and 9-1503 of the New York Environmental Conservation Law and Title 6, Section 193.3, of the *New York Codes, Rules and Regulations*. None of these species are known to occur in the proposed project area.

**Table 3-3. Federally protected plant species.**

Common Name	Scientific Name	Status
Sandplain gerardia	<i>Agalinis acuta</i>	Endangered
Seabeach amaranth	<i>Amaranthus pumilus</i>	Threatened
Small whorled pogonia ( <i>historic</i> )	<i>Isotria medeoloides</i>	Threatened

### 3.4.2 Environmental Consequences of the Proposed Project

#### **Construction Impacts**

Some wildlife might avoid the project area due to construction noise and increased human activity, and there could be some wildlife mortality due to the presence of vehicles and construction equipment. Habitat disruption would be minimal because construction activities would be temporary.

DOE determined there would be negligible effects to Federal or State of New York special-status species because they have not been observed in the project area and are not likely to be attracted to the project site. Although these species were observed at the Lido Beach Passive Nature Area over a quarter-mile away, their use of the proposed project site would be low because that area does not contain habitat or features to attract these species.

#### **Operations Impacts**

Due to the lack of presence in the area, the proposed project would have no effect on special-status mammal or plant life.

The following sections discuss the potential for bird and bat mortality from the operation of the proposed project. A National Wind Coordinating Committee analysis of studies on bird and bat mortality from wind turbines indicates that mortality is relatively low (NWCC 2010).

The project site, which is partially vegetated, is not suitable habitat for these species, further lowering the risk to those species.

**Bird Mortality.** The National Wind Coordinating Committee reviewed bird mortality data from several large multiturbine sites. Its review found that fatality rates from turbine operations for raptors (for example, hawks and eagles) at most wind energy facilities were relatively low. All facilities in the study reported fewer than 14 bird fatalities per year per megawatt (all bird species combined), with the majority reporting fewer than 4 fatalities annually per megawatt (NWCC 2010). Because the proposed project would include only one 100-kilowatt wind turbine, potential impacts to bird mortality are expected to be much less than those at large wind farms. Because of the size of the proposed project, DOE estimates that there could be 1 fatality per year from operation of the proposed project.

The site of the proposed project does not have large stands of trees, ridgelines, or grain fields, which are known to attract birds, which would further minimize the bird mortality risk.

The Town has operated a single wind turbine about 1,700 feet from the proposed project site since October 2009. Although this turbine is smaller (2.4 kilowatts and about 45 feet tall), it provides an

analogue for potential impacts from the proposed project. Since operations began, there have been no observed bird kills (Landi 2010).

Based on the Town's studies and the existing turbine's operational history, DOE finds that the proposed project would have negligible impacts on the local bird population. Further, it is unlikely that endangered roseate terns or threatened piping plovers would collide with the proposed turbine because neither have been observed in the proposed project area. DOE determined that the proposed project would be unlikely to affect these species.

Based on the lack of presence in the area, the probability that a bald or golden eagle would collide with the single wind turbine is negligible.

One or more individuals of the New York State species of concern in Table 3-3 could collide with the proposed wind turbine; however, DOE expects the annual rate of bird mortalities to be low for these species for the reasons discussed above. The loss of one or a few individuals of these species is not likely to adversely affect the bird populations.

**Bat Mortality.** There are no special-status species of bat in the area of the proposed project. Similar to bird populations in the vicinity, bat populations are not attracted to the area of the proposed project because it does not offer suitable bat habitat. While individual bats could encounter comparable risks and potential mortalities as the birds in the area, DOE determined effects on any bat species from the Proposed Action would be unlikely.

## 3.5 Noise

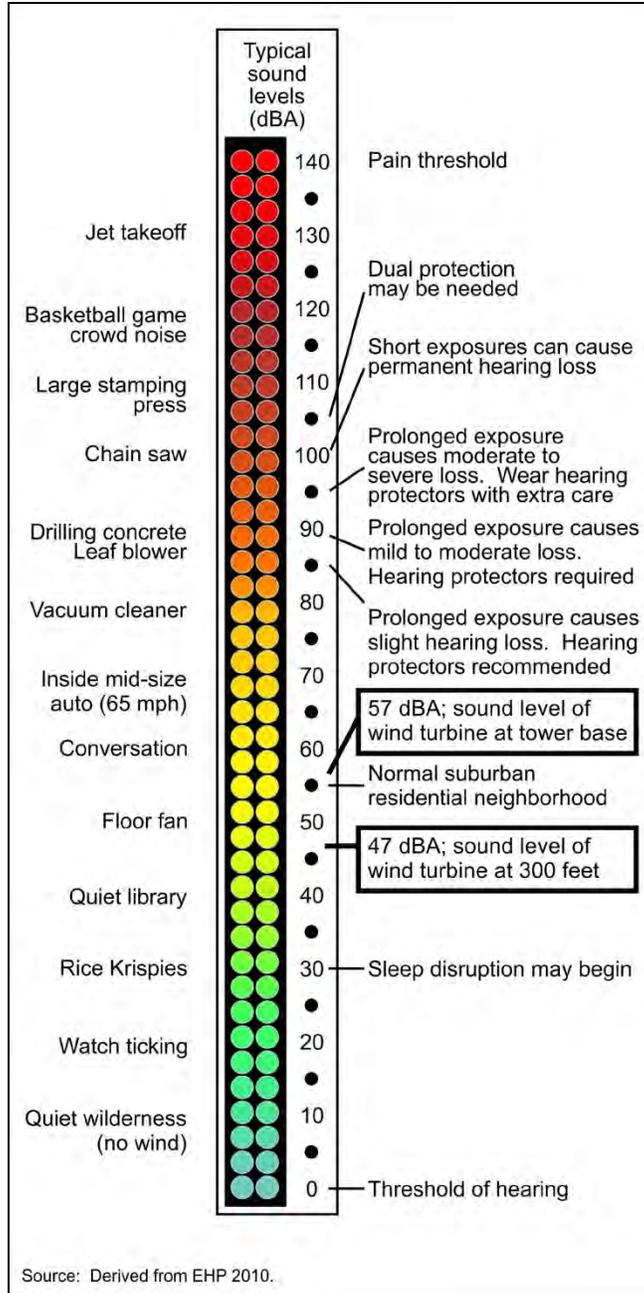
*Noise* can be sound of any type, but is often characterized as *unwanted* sound because it is loud, dissonant, unpleasant, unexpected, or unintelligible. Sound waves are measured by the pressure they create, and the way humans perceive the loudness of sound is expressed as the *sound pressure level* or sound level. Sound level is expressed in units of decibels above a standard reference level of 0 decibel, which corresponds to the threshold of human hearing (at 1 kilohertz, or 1,000 cycles per second). Sound level is often expressed using the A-weighted decibel (dBA); this scale is weighted toward those portions of the frequency spectrum between 20 and 20,000 hertz to which the human ear is most sensitive.

Commonly encountered sound levels are in the range of 40 to 100 decibels. The decibel is not a measured unit, but rather is the logarithm of the ratio of the measured sound pressure to the reference sound pressure. This allows ready comparison of the sound levels of a normal conversation at 40 decibels and a jet engine (100 feet away) at 150 decibels when the sound pressure measurements vary by a factor of 300,000. This jet engine sound pressure is more than 30 million times the reference sound pressure (0 decibel) (Colby et al. 2009; Wikipedia 2010).

The human ear perceives a 10-decibel increase in sound as approximately doubling in the loudness. Similarly, a 10-decibel decrease in sound is perceived as about one-half of the original noise level. A 3-decibel change is barely noticeable, while a 5-decibel increase is typically noticeable (EPA 1974). Figure 3-7 shows and discusses typical sound levels in A-weighted decibels.

### 3.5.1 Affected Environment

The Town has not conducted ambient sound level studies of the area because the nearest residential neighborhood is about one-quarter mile away. The Loop Parkway borders the site of the proposed wind turbine on the east (more than 200 feet away) and Lido Boulevard borders it on the south (about 400 feet away). Both of these streets have moderate traffic and are the source of most of the ambient noise. Based



**Figure 3-7. Typical sound levels on the A-weighted decibel scale.**

on noise levels from automobile traffic at 50 feet, which range from 60 to 90 decibels, noise in the proposed project vicinity from moderate traffic would range from 50 to 60 decibels (EPA 1978). The parking lot of the Administration Building and the fueling station are to the southeast of the proposed project, and the onsite vehicle traffic would be the other main source of ambient noise in the area.

### **3.5.2 Environmental Consequences of the Proposed Project**

#### ***Construction Impacts***

Potential noise impacts during construction would be of limited duration, mainly due to heavy equipment operations for preparing the site and foundation, trenching the power line that would connect the proposed turbine to the fueling station, and a crane the Town would use to assemble the tower and wind turbine. Multiple sources could be operating at the same time and could add a few A-weighted decibels to the highest individual sound level. For example, assume the equipment the Town would use to clear the site was two chainsaws, a front-end loader, and a truck. If the sound levels at a distance of 50 feet from two different chainsaws were 75 dBA and 78 dBA, the front-end loader noise was 80 dBA, and the truck noise was 78 dBA then, based on rules for accumulating sounds, the sound level from these four pieces of equipment operating simultaneously would be 83 dBA (NYDEC 2001).

The largest potential noise impact would be likely to occur during site preparation activities, which would last up to 2 weeks and could have multiple equipment sources. Installation of the tower and turbine would take less than 1 week and involve one piece of heavy equipment, a crane. The most likely affected area during this time would be the Administration Building, which is about 300 feet from the proposed construction activities. The sound level would be about 67 dBA at the exterior of the building. EPA has stated that an equivalent sound level of 70 decibels is protective of public health and welfare for all areas of hearing (EPA 1978). This level of noise could be an annoyance during the 2-week site preparation period. Noise impacts during the erection of the tower and turbine would tend to be somewhat lower because only one piece of heavy equipment would be in operation.

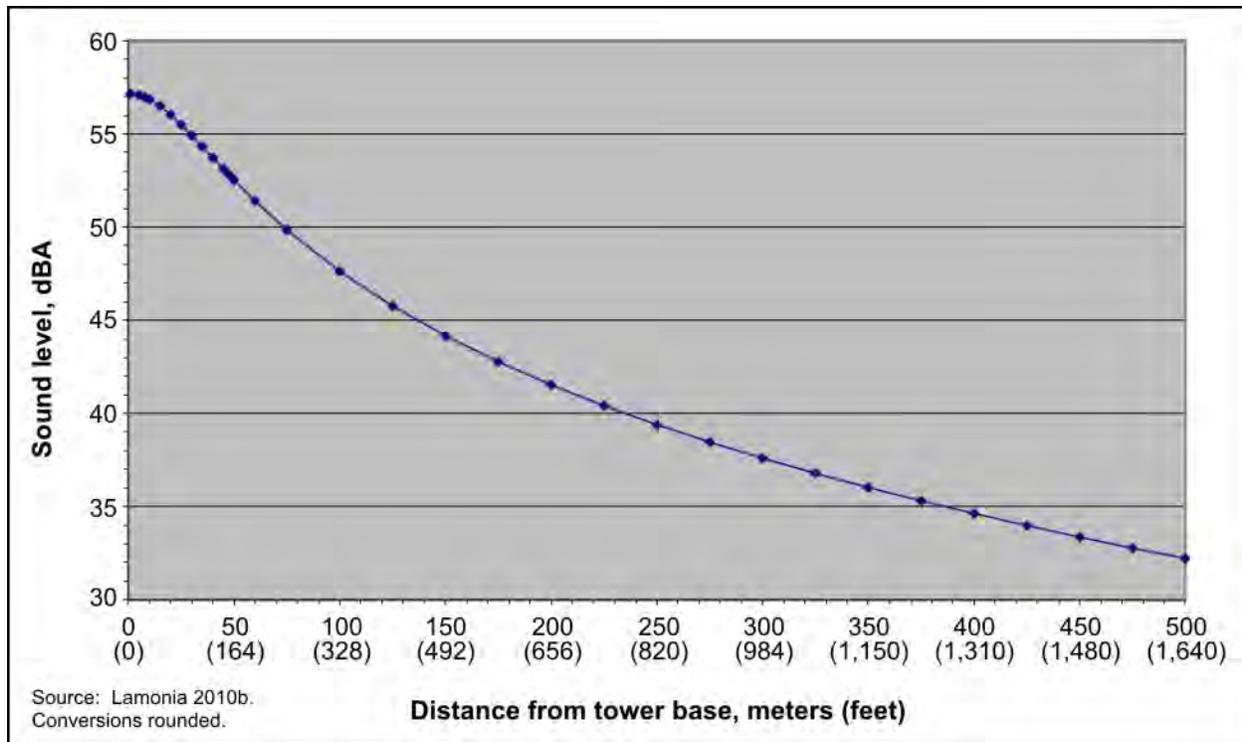
Potential noise impacts would be typical of a small construction project, and the noise impacts from construction would be small and temporary.

#### ***Operations Impacts***

The average wind speed at Point Lookout is about 13 miles per hour (NYSERDA 2010). Figure 3-8 shows the sound level as a function of distance from the base of the tower for a 13-mile-per-hour average wind speed (Lamonia 2010b). This application-specific noise information is generally consistent with the general sound propagation rule-of-thumb of a 6-decibel decrease for every doubling in distance from the source.

Figure 3-8 shows that at the base of the proposed turbine tower the noise level would be 57 dBA, which would not be appreciably higher than the average day-night noise level of a normal suburban residential area (55 decibels; EPA 1974). The noise level at the various facilities at the proposed project site would range from about 47 to 50 dBA. The noise level at other locations, including the East and West Marinas, would be lower at less than 45 dBA, which is typical of quiet residential areas. The nearest residential neighborhood is about a quarter-mile (1,300 feet) away; Figure 3-8 shows the potential turbine noise at this location would be less than 35 dBA. This level of noise is typical of a quiet library. As noted above, the EPA has determined that ambient noise levels of 55 decibels and lower do not present an annoyance in the outdoor environment (EPA 1978).

This information indicates that operational noise of the proposed turbine would be unobtrusive and unlikely to be an annoyance to most individuals in the area. Therefore, potential operational noise impacts would be minimal.



**Figure 3-8. Sound level in A-weighted decibels as a function of distance from the Northwind 100 wind turbine.**

## 3.6 Aesthetics and Visual Resources

Aesthetic and visual resources relate to the scenic quality (that is, visual appeal) of the landscape. This includes all natural and manmade objects, moving or stationary, that are visible on the landscape.

### 3.6.1 Existing Conditions

The visual character of the site for the proposed project is heavily vegetated with no existing onsite buildings or structures (Figures 2-5 and 2-6). The 4-acre parcel of Town property, the northeast corner of which would likely be the site of the proposed turbine, currently includes the Administration Building, the demonstration solar home, and the hydrogen and natural gas fueling station.

The visual character of the larger area includes a 190-foot water tower and a 45-foot wind turbine. Just to the east of the water tower and existing wind turbine is a passive nature preserve. The shoreline of Reynolds Channel is scenic and hosts two marinas. A Loop Parkway causeway that crosses the channel is visible from the marinas.

### 3.6.2 Environmental Consequences of the Proposed Project

#### ***Construction Impacts***

Temporary visual impacts would include construction trailers, the laydown and staging area, and construction equipment for about 2 weeks. The crane for assembling the proposed turbine would be visible from locations farther away for about 1 week. Therefore, aesthetic and visual impacts during construction would be small and temporary.

**Operations Impacts**

**Viewscape.** After installation, the proposed turbine would be visible in views along the shoreline, Point Lookout Beach, Loop Parkway, and the marinas along Reynolds Channel. The proposed project would not obstruct views toward the passive nature preserve, but might be visible at some locations in the preserve. Visibility from other locations in the area would depend on obstruction by trees and buildings. The adjacent land uses are not residential or resort oriented. DOE conducted a visual analysis from several locations and prepared visual simulations.

To present an approximation of the visual impacts of the proposed project, DOE took photographs from various locations around the proposed project area of its northeast corner and superimposed an image of the Northwind 100. These figures are approximations because a photograph cannot reproduce exactly what the human eye sees. Figure 3-9 shows the locations from which DOE took the photographs. Figures 3-10 to 3-14 show those views and provide the distance of the camera from the proposed turbine. To present the maximum potential impact, DOE assumed for these images that the turbine would directly face the viewer.



**Figure 3-9. Camera locations for view approximations.**



**Figure 3-10. Approximation of turbine appearance from West Marina looking east (about 690 feet).**



**Figure 3-11. Approximation of turbine appearance from Loop Parkway looking south across Reynolds Channel (about 740 feet).**



**Figure 3-12. Approximation of turbine appearance from East Marina looking west (about 690 feet).**



**Figure 3-13. Approximation of turbine appearance from soccer field looking north across Lido Boulevard (about 1,100 feet).**



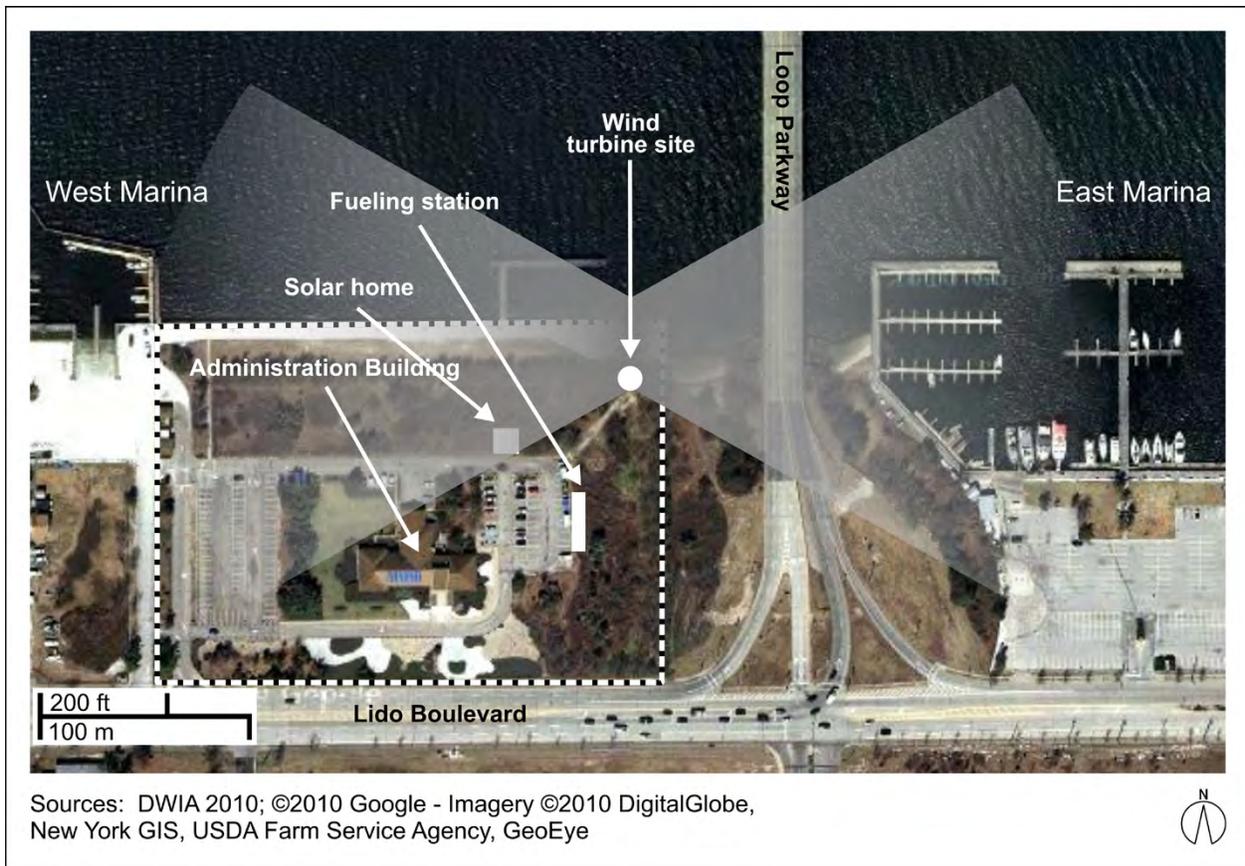
**Figure 3-14. Approximation of turbine appearance from the parking area at Point Lookout Town Park looking north (about 2,400 feet).**

Because the site and surrounding area has relatively flat terrain, trees and buildings would often hide the proposed turbine from view. DOE concluded that impacts to visual resources would alter the local viewscape but would not be inconsistent with the existing character of the proposed site.

**Shadow Flicker.** *Shadow flicker* is the effect caused by the shadows cast by moving wind turbine blades when the sun is visible. This can result in alternating changes in the light intensity viewers perceive. Shadow flicker does not occur when clouds or fog obscure the sun, when wind turbines are not operating, or when the blades are at a 90-degree angle to the receptor. While people can perceive shadow flicker outdoors, it tends to be more noticeable in rooms with windows that face the shadows (AWEA 2008). In general, 10 rotor diameters is a reasonable distance beyond which shadow flicker is of little concern. This limit for the proposed wind turbine, with a 69-foot rotor diameter, would be 690 feet.

DOE used a shadow flicker calculator (DWIA 2010) to perform a generic assessment of the potential extent of shadow flicker effects over the course of a year. The assessment used the latitude and longitude of New York, an average daily operating time of 75 percent (an average of 9 daylight hours), a rotor facing equal amounts of time in every direction, and 40-percent sunshine throughout the year. Figure 3-15 shows the potential area of shadow flicker within 10-rotor diameters (690 feet). Shadow flicker is intense near the turbine location but of short extent in the north and south directions. The intensity decreases rapidly but extends a longer distance to the east and west, as the figure indicates.

The location of the proposed project is advantageous for minimizing the effects of shadow flicker. Based on a 69-foot rotor diameter for the Northwind 100 wind turbine, a 690-foot radius of the proposed location would not include any residences and few businesses or government buildings. The solar home west of the proposed project as well as portions of the Administration Building would experience some shadow flicker effects during the morning hours. Boaters at the west end of the East Marina, which is just



**Figure 3-15. Approximate extent of potential shadow flicker effects.**

inside the 690-foot radius, would experience minimal effects in the late afternoon. Portions of Loop Parkway east of the turbine location also would experience shadow flicker in the late afternoon. Drivers on the parkway would notice these shadows for brief periods, but these would be unlikely to result in any impacts.

The Lido Beach Passive Nature Area and the West Marina are outside the area of effect. Key points of interest for shadow flicker would be the facilities at the proposed project site because they are within the 10-rotor-diameter distance. The actual area and time of effect would depend on the prevailing winds, which usually come from the south, west, or northwest (NYSERDA 2010). Along the outside edges of the marked zone, there would be only a few minutes of effect per year. DOE concluded shadow flicker impacts would be intermittent and small.

### 3.7 Occupational and Public Health and Safety

This section discusses potential health and safety impacts of the proposed project to workers and the public.

The following sections describe the existing conditions for occupational and public health and safety, potential impacts from construction and operations, and the potential for impacts from turbine events such as tower collapse and natural phenomena such as earthquakes and high-wind events (tornadoes and hurricanes, for example), which are hazards in the region (Nassau County 2005). The Nassau County Office of Emergency Management is responsible for directing the appropriate response to public

emergencies, including hurricanes and earthquakes, that could affect county residents (Nassau County 2010b,c).

### **3.7.1 Affected Environment**

The potentially affected areas for construction and operations, operational events, and natural phenomena differ. The following sections describe the affected environment for each category.

#### ***Construction and Operation***

The affected environment for construction and operation of the proposed project would include construction and maintenance workers. For potential occupational health and safety impacts, DOE uses rates from the Bureau of Labor Statistics as the basis for estimating impacts to workers.

For tower construction, the 2008 incidence rate for a fatal occupational injury in the construction sector of private industry is 9.7 fatalities per 100,000 full-time equivalent workers, where a full-time equivalent worker works 2,000 hours per year (BLS 2010). The nonfatal occupational injury and illness rate in the “power and communication line and related structures construction” subsector of private construction is 4 total recordable cases per 100 full-time equivalent workers (BLS 2009).

For periodic tower maintenance, the 2008 incidence rate for a fatal occupational injury in the general category of “installation, maintenance and repair occupations” is 6.7 fatalities per 100,000 full-time equivalent workers (BLS 2010). The nonfatal occupational injury and illness rate in the “other electric power generation” subsector of the utilities sector is 5.1 total recordable cases per 100 full-time equivalent workers (BLS 2009).

#### ***Potential Operational Turbine Events***

The affected environment would include all persons in the specific areas noted below, whether workers or members of the public. Visitors to the marina walkway north of the turbine site could be in the area of potential effect for the following events. Visitors to the marinas, soccer fields, and nature area would be outside these areas. The nearest residential neighborhood is about one-quarter mile away; operational events would not affect it.

**Ice Shed and Ice Throw.** The affected environment would be persons within the area shown in the blue circle in Figure 3-16.

Observations indicate that ice can build up more thickly on moving turbine rotors than on the stationary components. The rotor ice can break off and, if the rotor is moving, the motion can cast the ice some distance (AWEA 2008). Field observations indicate that most ice shedding occurs as temperatures rise and ice on the rotor blades thaws (AWEA 2008). A typical scenario is ice buildup on the rotor and the wind sensors, which are mounted on the nacelle. Sensor malfunction normally causes automatic shutdown in most modern wind turbines. In this situation, most turbines restart only when the ice has thawed and fallen from the stationary turbine and the operator has reset the sensors. However, in certain situations the operator can accelerate the process by thawing the sensors and restarting the turbine with ice still on the rotor (AWEA 2008).

There have been studies to characterize how the rotor blades might shed ice fragments. While limited information is available, the evidence suggests a tendency for ice fragments to drop off the rotor rather than be thrown off. In addition, ice would tend to shed more from the blade tips, and larger pieces of ice debris would tend to fragment as they fall (AWEA 2008). A Swiss study showed that much of the ice



**Figure 3-16. Extent of potential ice throw (blue circle; 300 feet) and turbine fall zone (red circle; 156 feet).**

(40 percent) would drop within the rotor diameter and include the heavier ice fragments (Cattin et al. 2007). Not unexpectedly, higher wind speeds would result in ice fragments falling farther from the turbine. The study developed an empirical equation to predict the extent of ice shedding based on hub height and rotor diameter. For the Northwind 100, the extent of ice shedding could reach as far as 300 feet.

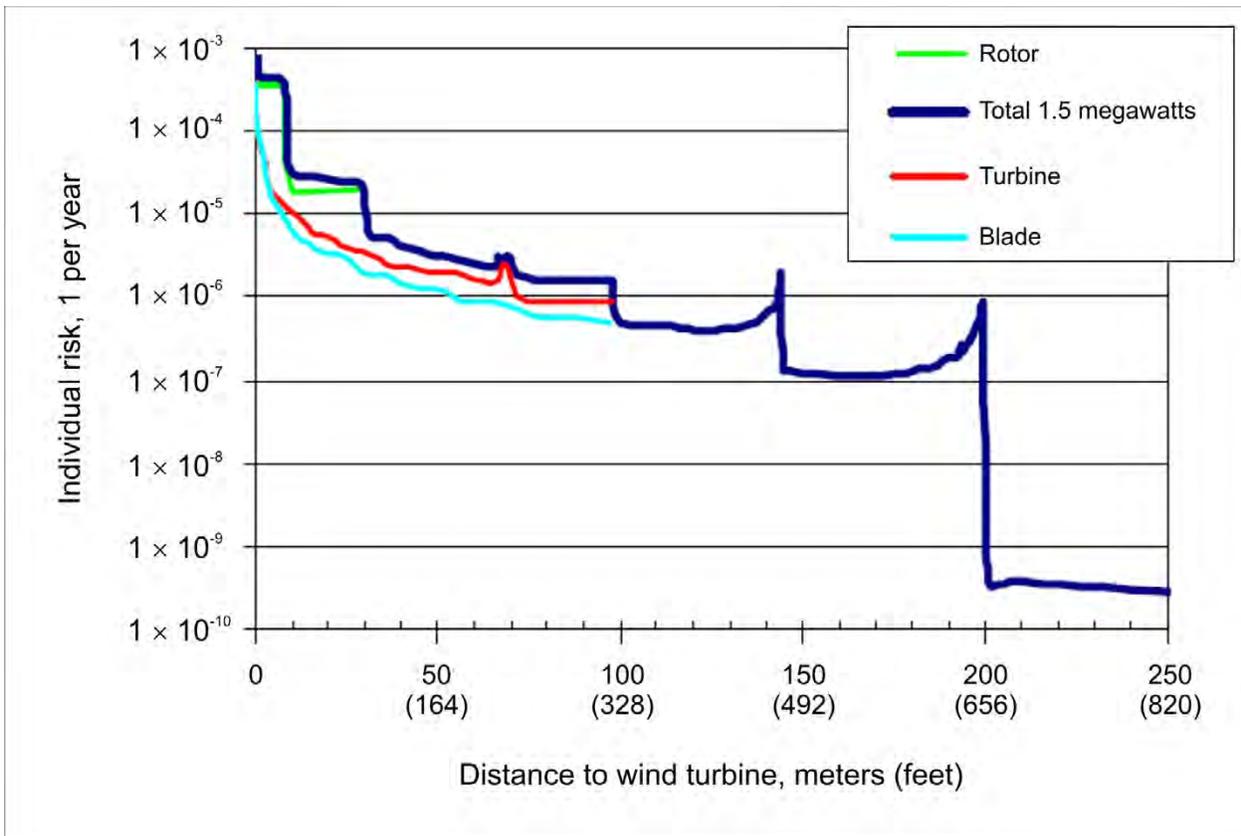
Normal safe operating practices that reduce or eliminate the potential for ice fall include education of operations staff about the conditions likely to lead to ice buildup on the turbine, the risk of ice falling from the rotor, the area of risk, use of warning signs alerting anyone in the area of risk, and curtailment of operation during periods of severe ice buildup (AWEA 2008).

**Blade Drop or Throw.** The affected environment would include persons close to the tower and within the fall zone (Figure 3-16), and most likely while the rotational speed was high.

Because of the rotational speeds of the blades when in motion, a blade could detach from the rotor while in motion. The trajectory of its fall would depend on the loading and stress state at the time of failure and on the type and progression of failure before separation. While cases of blade drop or throw have occurred, these incidents are rare and have generally been linked to improper assembly or operation that exceeded the design limits. Improved wind turbine design and engineering standards make the likelihood of such an occurrence extremely remote (AWEA 2008). Estimated component reliability and failure rates for wind turbines (Rideout and Bos 2009) indicate the chance of tip breakage to be  $1 \times 10^{-4}$  (1 chance in 10,000) per hour for tip breakage.

**Tower Collapse.** The affected environment would include persons within the 156-foot fall zone shown by the red circle in Figure 3-16 for the analyzed turbine site. The nearest road, Loop Parkway, is more than 200 feet away. The potential safety issues of wind turbine and tower siting and operations have primarily been addressed for 2-megawatt turbines that are much larger than the Town of Hempstead’s proposed 100-kilowatt turbine (Rideout and Bos 2009). A 2-megawatt turbine typically has a hub height of about 260 feet and a blade length of about 130 feet, in comparison with 122 feet and 34 feet, respectively, of the Northwind 100. Rideout and Bos (2009) provide an estimated probability of failure of the tower or anchor bolts of  $1 \times 10^{-7}$  (1 chance in 10 million) per hour.

A final generic environmental impact statement for a proposed wind farm elsewhere in New York assessed the risk of turbine failure (Moner-Girona and Kammen 2005). The individual risk at 330 feet is about 1 in 1 million for a generic 1.5-megawatt turbine with a rotor diameter of 250 feet. Figure 3-17 shows the individual risk as a function of distance from that turbine. The corresponding risk from a Northwind 100 would be less because of its smaller size.



**Figure 3-17. Individual risk per year of rotor drop, blade drop, and turbine collapse versus distance for a 1.5-megawatt wind turbine (Moner-Girona and Kammen 2005).**

**Natural Phenomena**

High-wind events and earthquakes are potential hazards in Nassau County (Nassau County 2005) and could adversely affect the proposed turbine and result in health and safety impacts to nearby members of the public. The high winds of hurricanes and tornadoes would have the potential to damage the wind turbine. The Northwind 100 is designed to withstand extreme wind speeds up to 133 miles per hour (NPS 2009).

The average annual probability of a Category 3 or stronger hurricane making landfall along the region of the Atlantic Coast from New York City to the eastern tip of Maryland is about 4 percent (Mandia 2010). A Category 3 hurricane would have sustained winds of 111 to 130 mph, and a Category 4 would have winds between 131 and 155 mph (NOAA 2010a). However, since 1856 no Category 4 or 5 hurricanes have made landfall in any part of New York (USLHPP 2010), so it is unlikely a hurricane would cause the proposed turbine to collapse. In addition, the area around Point Lookout would almost certainly be evacuated. The entire area lies within the storm surge zone for a Category 1 or 2 hurricane, and local, Nassau County, or New York state officials would initiate an evacuation order to protect residents. Because of these factors, the proposed turbine would be unlikely cause an injury or fatality during a hurricane.

Since 1960, there have been 27 tornados on Long Island, 9 of which were in Nassau County. The strongest on Long Island had an Enhanced Fujita Scale rating of EF2 (Hoffman 2009), which can have 3-second wind gusts of about 110 to 137 miles an hour (NOAA 2010b). Therefore, the probability of a tornado striking the proposed turbine with enough force to damage it would be small. Again due to turbine siting and severe weather precautions, impacts to human health and safety would be highly unlikely.

Nassau County is an area of moderate seismic risk. Point Lookout has a 2-percent probability of exceeding a peak ground acceleration of 0.14 percent of  $g$  ( $g$  is the force of gravity on Earth) (USGS 2009). For perspective, an earthquake with this acceleration would be level IV on the Modified Mercalli Scale. Many people indoors, but few outdoors, would feel a level IV earthquake during the day; a nighttime earthquake of that level would wake some people. Dishes, windows, and doors would be disturbed, and walls would make creaking sounds. The sensation would be like that of a heavy truck striking a building. Parked automobiles would rock noticeably. An earthquake of this intensity would be unlikely to damage the proposed turbine enough to cause health and safety impacts.

### **3.7.2 Environmental Consequences of the Proposed Project**

#### ***Construction Impacts***

Site preparation, construction of the tower foundation, and trenching and installation of the underground power line to the hydrogen fueling station would require an estimated five workers for as long as 2 weeks. Installation of the Northwind 100 turbine to the manufacturer's specifications would take four workers an additional 5 days, while commissioning would take one technician another 3 days (NPS 2008).

Based on the 2008 incident rates (BLS 2009, 2010) for construction and operations workers, the chance of a fatal occupational injury to a construction worker would be minimal, and the chance of an occupational illness or injury would be about 1 percent. Therefore, a fatality or injury would be unlikely during construction activities.

There would be little potential for health and safety impacts to the public because of the location and use of the site, and the nearest residential neighborhood is about one-quarter mile away. The chance of health and safety impacts to the public would be minimal.

#### ***Operations Impacts***

DOE based its estimate of industrial safety impacts to workers from operation of the proposed turbine on one technician spending about 2 days per year to perform maintenance activities. Based on the 2008 incident rates (BLS 2009, 2010), the chances of a fatal occupational injury or an occupational illness or injury would both be small. Over a 20- to 40-year turbine lifespan, the chances of a fatality or injury

would be less than 1 percent. A worker fatality or injury during wind turbine operations would therefore be unlikely.

In relation to public health and safety, the potential for impacts from normal turbine operations would be small because there are no permanent residences in the potentially affected areas.

The electrical line from the proposed wind turbine to the fueling station would generate an electromagnetic field, as do all electrical wires. However, wind turbines are not a significant source of electromagnetic field exposure because field levels around wind farms are low (CMOH 2010). The cable would be underground, which would eliminate most exposure to that portion of the field. Some small exposure could occur to workers or members of the public immediately adjacent to the turbine from the cable that would run from the nacelle into the ground, but this exposure would be minimal to negligible, in part because the line would not carry enough electricity to generate a strong electromagnetic field.

### ***Potential Operational Turbine Events***

DOE conducted this analysis for the site of the proposed turbine as shown in Figure 3-16. However, the actual location of the turbine in the northeast corner of the site has not yet been determined because geotechnical and other siting studies are not yet complete.

**Ice Shed and Ice Throw.** Ice could build up on the proposed wind turbine during certain weather conditions. The Town would use best management practices and trained operators to reduce the potential for ice throw. Therefore, DOE expects impacts from ice shed or ice throw would be minimal.

**Blade Drop or Throw.** Based on the information in the affected environment section above, DOE determined the risk of blade drop from the proposed wind turbine would be small.

**Tower Collapse.** Before installation, the Town would conduct geotechnical studies to determine the optimum location and foundation requirements and would factor the tower collapse zone into determining the exact location of the proposed turbine in the northeast corner of the project site. The risk of tower collapse would be very small and, therefore, the potential for impacts to health and safety would be minimal.

### ***Natural Phenomena***

Although there have been tornados, hurricanes, and earthquakes in the area, they have a low probability of occurrence. In conjunction with Nassau County emergency management measures, the risk of impacts from the proposed turbine under these conditions would be small.

## **3.8 Environmental Consequences of the No-Action Alternative**

Under the No-Action Alternative, DOE would not authorize the Town to expend Federal funding for the Proposed Project. As a result, the project could be delayed until the Town could identify other funding sources. The project could also be abandoned if other funding sources could not be obtained. If the project were abandoned, reductions in fossil fuel use and improvements in energy efficiency would not occur and DOE's ability to achieve its objectives for renewable energy and energy efficiency would be impaired. In addition, if the proposed project did not proceed, the potential impacts to the resource areas discussed above would not occur.

If the project did proceed without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's Proposed Action (that is, providing assistance that allows the project to

proceed). In order to allow a comparison between the potential impacts of a project as implemented and the impacts of not proceeding with a project, DOE assumes that if it decided to withhold assistance from this project, final design and construction of the Town's Proposed Project would not proceed.

## 4. CUMULATIVE IMPACTS

The Council on Environmental Quality NEPA regulations require that the cumulative impacts analysis in an EA consider the potential environmental impacts from the “incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions” (40 C.F.R. 1508.7). Because the impacts of the proposed project generally would be minor and localized, DOE focused its evaluation of cumulative impacts of the proposed project in combination with on past, present, and reasonably foreseeable future actions (plans) in the vicinity around the proposed project area.

Cumulative impacts result from the incremental effects the proposed project could have in combination with the impacts of past, present, and reasonably foreseeable actions. Under the proposed project, the Town of Hempstead would install and operate a 100-kilowatt wind turbine. The proposed project would provide electricity to the Town’s existing hydrogen and natural gas fueling station.

The following paragraphs describe current and planned features of the Town’s Clean Energy Project in the area (Town of Hempstead 2009a, 2010b; Schneider 2010c).

### ***Hydrogen and Natural Gas Fueling Station***

The goal of the hydrogen fueling station project is to demonstrate the generation of hydrogen and a blend of hydrogen and natural gas and the use of these fuels in motor vehicles. It is the first hydrogen fueling station on Long Island, the fifth in the New York City metropolitan area, and the ninth in New York State. The station became operational in October 2009. The photograph shows the completed station.



### ***New York Institute of Technology Zero-Energy Solar Home***

The solar home is a self-relying green energy house the Town procured from the Institute after its entrance in DOE’s 2007 Solar Decathlon. The home demonstrates the possibility of sustainable living through a design that is adaptable and incorporates smart technology and creative engineering. Once installation is complete, it will be a working administrative office for the Town’s Conservation and Waterways Department as well as a showcase for the potential of alternative energy generation and

energy-efficient design. The solar home will also host tours and educational programs. The photograph shows work underway on installation of the solar home.



### ***Solar- and Wind-Powered Shellfish Farm***

This innovative project uses alternative energy to grow clams and oysters. The system consists of a building on pilings above the water and a floating upwelling barge (behind the building in this view). There is a 5-kilowatt solar array on the top of the building, a 5-kilowatt array on the barge, and a 45-foot 2.4-kilowatt wind turbine. The shellfish project is expected to improve the natural shellfish reefs in the area, reduce costs through clean energy efficiency, and help sustain the livelihood of Long Island fisheries. The Town expects the nursery to increase production to 8 million clams and oysters per year. The facility began operations in October 2009.



### Solar Array and Solar Car Port

The Town has installed a 10-kilowatt solar array on the roof of the Administration Building and has a solar car port at the Department of Conservation and Waterways that recharges electric cars, including the Town's fleet of more than 75 Global Electric Motorcars.



### Planned 100-Kilowatt Solar System

In addition to the above, the Town plans to add to its Clean Energy Project facilities at the 4-acre site starting in 2011. One project is a multiple array solar panel system of approximately 100 kilowatts. The system would feature both canopy- and pole-mounted panels with single- and dual-azimuth tracking. The Town would tie this system to the electrical grid to provide excess power to other grid users. The photograph shows the planned locations of these new solar panel installations in dark blue.



### ***Planned 10-Kilowatt Charging Station***

A second future project involves installation of a 10-kilowatt solar array at the East Marina to enable the general public to charge electric or hybrid vehicles. This array would also tie to the grid. The photograph shows the planned location for this charging station in light blue.



### ***Planned Marina Repair or Replacement***

The Town plans to repair or replace the West Marina bulkhead within 5 years. The bulkhead is the vertical structure under the marina walkway that prevents erosion of the shore from wave action. The photograph below shows the wooden pier structure of the existing bulkhead.



### ***Potential Cumulative Impacts***

The proposed project would have the following cumulative impacts with these existing efforts:

- Geology and Soils. The proposed project combined with the planned solar systems and marina bulkhead repair or replacement would contribute small incremental impacts to soil disturbance

from installation as well as trenching to tie the solar system elements to one another and the electric grid.

- Air quality. The proposed project combined with the existing wind turbine at the shellfish farm would reduce the use of carbon-based energy by over 300,000 kilowatt-hours per year. The solar panels, the conversion of the demonstration solar home to administrative offices, and the electric cars will further reduce the reliance on conventional carbon-based electricity and fossil fuels for vehicles.
- Noise. The proposed turbine would contribute small incremental impacts to local ambient noise levels.
- Aesthetics and Visual Resources. The existing wind turbine at the shellfish farm has altered the visual landscape but is shorter than either the proposed wind turbine or the existing 190-foot water tower. The immediate vicinity around the proposed wind turbine would then include three vertical structures. Additional vertical components of the viewscape include the tall masts and sails of some of the sailboats at the East and West Marinas. All of these features cumulatively contribute to alter the natural landscape. The planned solar arrays and charging station would have small cumulative impacts on the viewscape.
- Biological Resources. The Town's existing 2.4-kilowatt wind turbine has been operational for about 1 year. Monitoring and surveys have revealed no deaths among birds and bats. The proposed wind turbine could combine with the existing turbine and result in bird and bat death rates, but DOE expects the increase would be limited to one bird fatality per year and likely no bat mortalities per year.

The proposed project would have small cumulative impacts with existing activities at the proposed site. In combination with the proposed project, other elements of the Town of Hempstead's Clean Energy Project would cumulatively reduce the use of carbon-based energy by over 300,000 kilowatt-hours per year. The proposed turbine would contribute small incremental impacts to local ambient noise levels. Cumulative impacts to visual and aesthetic resources would be small because of the existing vertical components of the viewscape. The proposed wind turbine could combine with the existing turbine and result in bird and bat death rates, but DOE expects the increase would be limited to one bird fatality per year and likely no bat mortalities per year.

## **5. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

This section includes an analysis of irreversible and irretrievable commitments of resources. A commitment of resources is irreversible when its primary or secondary impacts limit the future options for a resource or limit those factors that are renewable only over long periods. Examples of nonrenewable resources are minerals, including petroleum. An irretrievable commitment of resources refers to the use or consumption of a resource that is neither renewable nor recoverable for use by future generations. Examples of irretrievable resources are the loss of a recreational use of an area. While an action can result in the loss of a resource that is irretrievable, the loss can also be reversible. Irreversible and irretrievable commitments of resources relate primarily to construction activities.

In the short term, the proposed wind turbine would require the use of the land on which the turbine would stand and the resources necessary to operate and maintain the turbine, such as lubricants. There would be no impact to the site's long-term productivity because the Town could use the site for other purposes or return it to a more natural state after the turbine's 20- to 40-year working lifespan.

The proposed project would result in the irreversible commitment of resources necessary to fabricate the wind turbine components, prepare the site, install the turbine, and provide maintenance for its operational life; these materials would consist of small amounts of concrete, gravel, gasoline, lubricants, electricity, water, metals, and composite materials. The expenditure of ARRA funding from DOE would also be irreversible. The wind turbine site would represent an irretrievable commitment of land during its operational life.

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## 7. NOTIFICATION LIST

### **Federal, State, and Local Agencies**

Thomas Cuddy  
Office of Environment and Energy  
Federal Aviation Administration

Mark Dougherty  
Director of Distributed Generation and Renewable Programs  
Long Island Power Authority

Sheref Fathi  
New York State Department of Transportation

Scott Fish, Engineer  
Long Island State Park Commission

Michael Lenane, Deputy Commissioner  
Division of Environmental Permits  
New York Department of Environmental Conservation

Elizabeth Martin  
New York State Historic Preservation Office

Ron Masters, Commissioner  
Department of Conservation and Waterways  
Town of Hempstead

Grace Musumeci  
Chief, Environmental Review Section  
U.S. Environmental Protection Agency

Steve Papa  
Senior Fish and Wildlife Biologist  
U.S. Fish and Wildlife Service  
Long Island Field Office

The Honorable Andrew Cuomo  
Governor of New York

Tara Schneider  
Conservation Biologist  
Department of Conservation and Waterways  
Town of Hempstead

Peter A. Scully  
Regional Director, Region 1  
New York Department of Environmental Conservation

**American Indian Nations**

The Honorable Randy King  
Chairperson  
Shinnecock Indian Nation

The Honorable Harry B. Wallace  
Chief  
Unkechaug Indian Nation of Poospatuck Indians

Dr. Bruce Obermeyer  
Delaware Tribe (Kansas)

Ms. Tamara Francis  
NAGPRA Director  
Delaware Nation of Oklahoma

**Other Interested Groups**

William Eubanks  
Meyer, Glitzenstein & Crystal  
National Audubon Society

Kim Van Fleet  
Important Bird Area Coordinator and Staff Biologist  
National Audubon Society

Eric Glitzenstein  
Meyer, Glitzenstein & Crystal  
National Audubon Society

Michelle P. Scott  
Vice President and General Counsel  
National Audubon Society

Phil Wallis  
Vice President  
National Audubon Society

## **APPENDIX A SCOPING, CONSULTATION, AND COMMENT LETTERS**

This appendix contains copies of the scoping letter and DOE's letters of consultation. The letters to the Indian Nations were identical except for the addressees, so this appendix only reproduces one.

- DOE scoping letter, page A-2;
- EPA response to scoping letter, page A-11;
- DOE letter to New York SHPO, page A-12;
- New York SHPO response, page A-21;
- DOE response to New York SHPO, page A-23;
- New York SHPO second response, page A-28;
- DOE letter to FWS, page A-29;
- DOE letter to Shinnecock Indian Nation, Unkechaug Indian Nation of Poospatuck Indians, Delaware Nation, and Delaware Tribe, page A-35;
- Delaware Tribe response, page A-45; and
- EPA comment on Draft EA, page A-.



**Department of Energy**

Golden Field Office  
1617 Cole Boulevard  
Golden, Colorado 80401-3393

September 16, 2010

To: Distribution List

Subject: Notice of Scoping and Proposed Floodplain Action – Town of Hempstead Wind-To-Hydrogen Project at Point Lookout New York

DOE is proposing to provide federal funding through the American Recovery and Reinvestment Act of 2009 to the Town of Hempstead (the Town), Nassau County, New York. The Town is proposing to use the federal funding to construct and operate a 100-kilowatt wind turbine as a renewable source of electricity to run the electrolyzer that generates hydrogen at the Town's existing hydrogen and natural gas fueling station. The hydrogen and natural gas power a small fleet of Town vehicles. The attached Project Description details the proposed project and its location, which is just inside the boundary of the 100-year floodplain; however, modification to the floodplain is not expected.

Pursuant to the requirements of the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations (40 CFR Parts 1500 to 1508), DOE's NEPA implementing procedures (10 CFR Part 1021), and DOE's obligations for a floodplain assessment (10 CFR 1022), DOE is preparing the draft EA to:

- Identify any adverse environmental effects and potential associated mitigation measures should this proposed action be implemented;
- Evaluate viable alternatives to the proposed action, including a no action alternative;
- Describe the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity;
- Characterize any irreversible and irretrievable commitments of resources that would be involved should this proposed action be implemented; and
- Identify and discuss effects of the proposed project on floodplains.

**Potential Environmental Effects or Issues Identified for the Environmental Assessment**

The EA will identify, describe, and determine potential impacts, if any, on the environment and address mitigation to eliminate or reduce those impacts, as appropriate. DOE will evaluate the potential impacts that could result to:

- Water Resources (including floodplains)



- Historic and Cultural Resources
- Biological Resources
- Noise
- Aesthetics and Visual Resources
- Socioeconomics
- Environmental Justice
- Occupational and Public Health and Safety

DOE will make this letter available to all interested federal, state and local agencies to provide input on issues to be addressed in the EA. Agencies are invited to identify the issues, within their statutory responsibilities that should be considered in the EA. The general public is also invited to submit comments on the scope of the EA.

#### **Development of a Reasonable Range of Alternatives**

NEPA requires DOE to consider a reasonable range of alternatives to the proposed action during an environmental review. The definition of alternatives is governed by the "rule of reason." An EA must consider a reasonable range of options that could accomplish the agency's purpose and need and reduce environmental effects. Reasonable alternatives are those that may be feasibly carried out based on environmental, technical, and economic factors. DOE will determine the need for project redesign or a project alternative during the course of environmental review.

The EA will address the No-Action Alternative, in which DOE would not provide federal funding to the proposed project. DOE assumed for analysis that the Town of Hempstead would not proceed with the proposed wind turbine project without the Department's assistance.

#### **Public Participation**

DOE invites the public and agencies to identify the issues that they feel the Department should consider in the EA. The Department will post the draft EA in the DOE Golden Field Office online reading room later this year at [http://www.eere.energy.gov/golden/reading\\_room.aspx](http://www.eere.energy.gov/golden/reading_room.aspx).

The DOE Golden Field Office welcomes your input throughout DOE's NEPA process, but to ensure that your comments are received in time for consideration in the EA, please provide them on or before **October 1, 2010**, to:

Melissa Rossiter  
NEPA Document Manager  
U.S. Department of Energy  
Golden Field Office  
1617 Cole Boulevard,  
Golden, Colorado 80401  
[melissa.rossiter@go.doe.gov](mailto:melissa.rossiter@go.doe.gov)

We look forward to hearing from you.

Sincerely,



Melissa Rossiter  
NEPA Document Manager

Enclosure: Project Description

**PROJECT DESCRIPTION****TOWN OF HEMPSTEAD WIND-TO-HYDROGEN FACILITY****POINT LOOKOUT, NASSAU COUNTY, NEW YORK**

The Town of Hempstead (the Town), Nassau County, New York proposes to construct and operate a 100-kilowatt wind turbine to supply a source of renewable electricity to the Town's existing hydrogen and natural gas fueling station at 320 Lido Boulevard, Point Lookout, New York. A feasibility study shows the wind resource to be favorable for energy generation.

Point Lookout is at the east end of a barrier island that lies between Reynolds Channel and the Atlantic Ocean. Figure 1 shows the location of Point Lookout within the Town of Hempstead and the greater Nassau County, Long Island, and New York City region. The Town's facility is adjacent to the Lido Beach Passive Nature Area.

This proposed wind turbine project is part of the Town of Hempstead's larger clean energy initiative to implement and demonstrate clean, renewable, and sustainable energy technologies. Solar energy, wind energy, and alternative fuels such as hydrogen are all part of the Town's clean energy portfolio. As Figure 2 shows, current Clean Energy Project facilities at Point Lookout include a solar- and wind-powered shellfish aquaculture facility with a 2.4-kilowatt wind turbine, a 10-kilowatt solar array on the roof of the Administration Building, the New York Institute of Technology Zero-Energy Solar Home, and the hydrogen fueling station. Figure 2 also shows the approximately 4-acre area, denoted by the dotted line that includes the existing fueling station and the site of the proposed 100-kilowatt wind turbine. Figure 3 is a closeup of the 4-acre site that would include the proposed wind turbine.

The Town owns and operates the hydrogen and natural gas fueling station at Point Lookout. The station currently uses electricity from the electrical grid to run an electrolyzer to generate hydrogen. The hydrogen and natural gas are stored on the site in aboveground storage tanks. The Town dispenses pure hydrogen, a hydrogen and natural gas blend, and compressed natural gas to fuel a small fleet of Town vehicles.

The Town would use the proposed 100-kilowatt wind turbine to generate renewable electricity to run the electrolyzer that generates the hydrogen. A schematic of the process is shown in Figure 4. Each year, the wind turbine would replace approximately 200,000 kilowatt-hours of electricity (at an average wind speed of 14 miles per hour) that the Town currently purchases from the local electrical grid.

The Town would locate the proposed 100-kilowatt wind turbine in the northeast corner of the same site as the Town's fueling station; the turbine would require a permanent footprint of about 950 square feet. The total Clean Energy Project site is about 4 acres of Town-owned land between the West Marina to the north and Lido Boulevard to the south and between the marina access road to the west and Loop Parkway to the east. Depending on the results of geotechnical investigations, the installation might require a deep concrete foundation and/or pilings to support the tower. There would be no guy wires or fencing.

Site preparation activities would include clearing heavy brush around the wind turbine site. Two construction trailers would be placed in the parking lot to the Administration Building. Access to the wind turbine site would be developed from the parking lot. The wind turbine components would be delivered by truck in three sections. A 100-ton crane would be used to install the tower. The temporary crane pad area would require about 1,200 square feet. A temporary construction staging or laydown area would encompass an area of about 4,500 square feet. The electrical tie-in to the fueling station would be underground and would require additional switchgears. The proposed turbine site is vacant with no buildings or structures and is overgrown with vegetation.

The Town of Hempstead proposes to install a Northwind<sup>®</sup> 100 wind turbine, a product of Northern Power Systems of Barre, Vermont. The proposed turbine would weigh approximately 23 tons with a hub about 121 feet above the ground. The turbine would have three blades, each about 33 feet long. The diameter of the rotor is about 69 feet so the tips of the blades would extend from approximately 96 feet above ground to about 156 feet.

The wind turbine would operate with a variable rotor speed ranging from 0 to 59 revolutions per minute. The turbine cuts in to generate electricity when wind speeds reach 7.8 miles per hour, and it cuts off at 56 miles per hour to prevent damage from higher wind speeds. The turbine is designed to withstand winds up to 133 miles per hour. The turbine would have dual-braking capabilities. The Northwind 100 uses a main shaft braking system that can be motor applied for normal braking and is fail safe in emergency conditions.

Figure 1. General location of Point Lookout, Town of Hempstead, Nassau County, New York.



Figure 2. Town of Hempstead Clean Energy Project site showing existing facilities and proposed project elements.

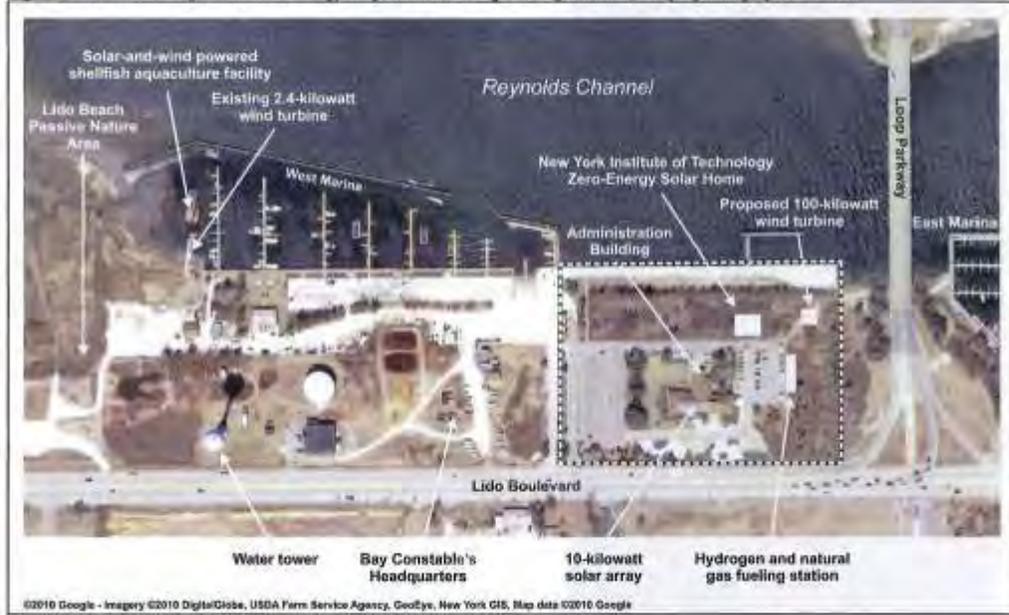
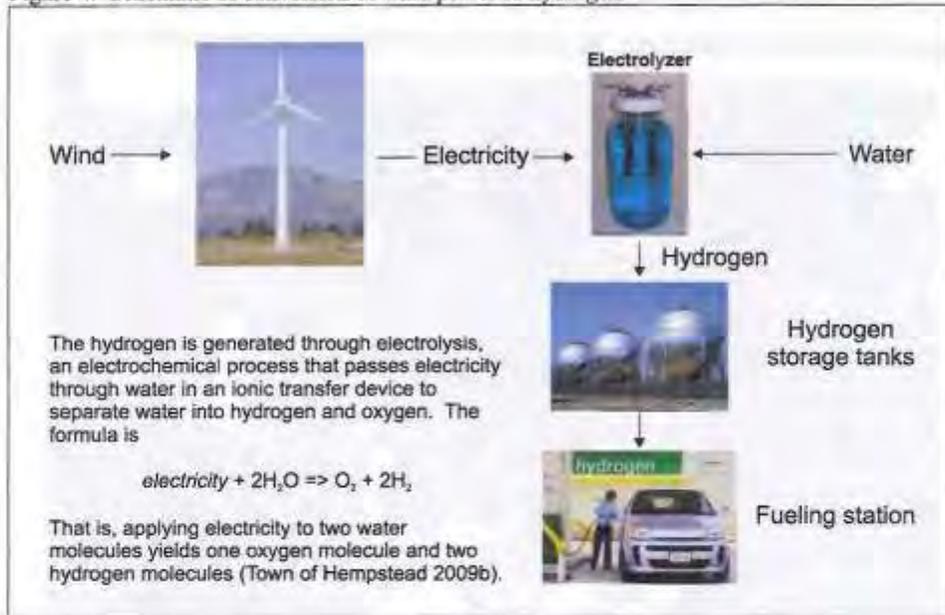


Figure 3. Closeup of the proposed project area.



Figure 4. Schematic of conversion of wind power to hydrogen.



Sent: Thursday, October 07, 2010 9:32 AM  
To: Rossiter, Melissa  
Cc: Ramakrishnan.Rajini@epamail.epa.gov  
Subject: Wind-to-hydrogen project at Point Lookout, #2

Dear Ms. Rossiter,

I am reviewing the project above under the Sole Source Aquifer Project and have the following questions:

How far below grade (ground surface) will the trunk of the wind turbine extend? Will it extend below the water table? If it will extend below the water table, how will the excavated space be dewatered before or during installation? What are the closest public water supplies to the proposed site? Are any residents within a mile of the site (on the barrier island) using private wells?

Thank you for trying to find the answers to these questions.

Sincerely,

Stephen Gould  
U.S. Environmental Protection Agency  
290 Broadway - 24th floor  
New York, NY 10007  
(212) 637-3882



**Department of Energy**

Golden Field Office  
1617 Cate Boulevard  
Golden, Colorado 80401-3399

September 16, 2010

Ms. Elizabeth Martin  
New York State Historic Preservation Office  
Peebles Island Resource Center  
P.O. Box 189  
Waterford, New York 12188-0189

Subject: Town of Hempstead Wind to Hydrogen Project – Section 106 Consultation

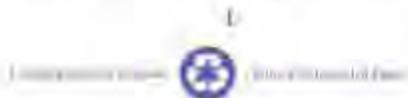
Dear Ms. Martin:

By this letter, the U.S. Department of Energy (DOE or the Department) is consulting with the New York State Historic Preservation Office (NYSHPO) pursuant to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800 for the Town of Hempstead's wind to hydrogen energy project. DOE is also conducting public scoping for this proposed project. The Department will post a scoping letter on the Golden Field Office Public Reading Room website at [http://www.eere.energy.gov/golden/reading\\_room.aspx](http://www.eere.energy.gov/golden/reading_room.aspx). Attachment 1 is a completed Project Review Cover Form for this project.

DOE's Proposed Action is to provide a financial assistance grant to the Town of Hempstead to facilitate the construction and operation of a 100-kilowatt wind turbine at Point Lookout, Town of Hempstead, Nassau County, New York (the proposed undertaking). DOE is not considering other action alternatives for the proposed site under this initiative.

The Town of Hempstead's proposed project is to construct and operate a 100-kilowatt wind turbine in close proximity to the Town's existing hydrogen and natural gas fueling facility at 320 Lido Boulevard, Point Lookout, New York. The proposed project site is within Nassau County. Point Lookout is located at the east end of a barrier island that lies between Reynolds Channel and the Atlantic Ocean. Figure 1 is the U.S. Geological Survey 7.5-minute Jones Inlet quadrangle that shows the direct area of potential effect (APE). For purposes of evaluation, the Department considers the tower footprint, the crane pad, and the construction staging and laydown areas as the direct APE. In addition, the EA will evaluate a larger area for some resources areas such as aesthetics. Figure 2 shows the general location of Point Lookout within the Town of Hempstead and the greater Long Island and New York City region.

The Town owns and operates a hydrogen and natural gas fueling station at Point Lookout. The station currently uses electricity from the grid to run an electrolyzer to generate hydrogen. The hydrogen and natural gas are stored on the site in existing aboveground storage tanks. The Town dispenses pure hydrogen, a natural gas blend, and compressed natural gas to fuel a small fleet of Town vehicles. The proposed 100-kilowatt wind turbine, collocated with the hydrogen fueling station, would generate renewable electricity to run the electrolyzer to generate hydrogen.



There are no existing buildings or structures on the proposed wind turbine site. The total project site is approximately 4 acres of Town-owned land. The site contains an administration building, the hydrogen-fueling station, and a zero-energy solar home; it is located between Lido Boulevard on the south and Reynolds Channel on the north, and between the eastern boundary of the Town's property and the entrance driveway on the west. The wind turbine installation would be in the northeast corner of the site and require an area of approximately 950 square feet. Depending on the results of geotechnical investigations, a deep concrete foundation and/or pilings could be necessary to support the tower. No guy wires or fencing would be used. Figure 3 provides a satellite view of the Town's Clean Energy Project facilities and the proposed wind turbine project location within its boundaries. Figure 4 is a closeup of the proposed 4-acre site.

Site preparation activities would include the clearing of heavy brush around the wind turbine site. Two construction trailers would be placed in the parking lot of the Administration Building. Access to the wind turbine site would be developed from the parking lot. The wind turbine components would be delivered by truck in two shipments. For tower installation, a 100-ton crane would be used. The temporary crane pad area would be about 1,200 square feet. A temporary construction staging and laydown area would encompass an area of about 4,500 square feet. Electrical tie-in to the fueling station would be underground and would require additional switchgears. Figure 5 shows a view of the proposed wind turbine site.

The Town proposes to select a Northwind<sup>®</sup> 100 wind turbine. The proposed turbine would weigh approximately 23 tons with a hub about 121 feet above the ground. The turbine would have three blades, each about 33 feet long. The diameter of the rotor is about 69 feet so the tips of the blades would extend from approximately 96 feet above ground to about 156 feet. The tower would be constructed of steel, the nacelle cover and blades would be constructed of a fiberglass composite. The wind turbine would operate with a variable rotor speed ranging from 0 to 59 revolutions per minute. The cut-in speed of 7.8 miles per hour is the minimum wind speed necessary to operate the turbine. The wind cut-out speed is 56 miles per hour. The extreme wind speed is 133 miles per hour.

DOE has conducted a review of the NYSHPO online resources historic preservation database for the preliminary presence or absence of previously identified cultural resources within or adjacent to the project area. That review identified the project location to be adjacent (west) to a portion of the geographically large Jones Beach State Park, Causeways, and Parkways System (Site #04NR05404), which is listed on the *National Register of Historic Places*. The specific portion of the system that is adjacent to the project area is the north-south Loop Parkway, which crosses Hempstead Bay (Figure 2). In addition, an unidentified archaeologically sensitive area listed in the NYSHPO database is approximately one-half mile south of the project location, just offshore along the beach.

Although there are some cultural resources nearby, DOE has determined the project would not cause any effects to historic or archaeological resources in the Point Lookout area and the APE; the site is on a developed 4-acre parcel of land and the footprint for the turbine tower is small. The wind turbine would, however, be visible from a relatively wide area. DOE is preparing an environmental assessment (EA) for this project to meet the requirements of the National Environmental Policy Act of 1969. DOE will send a copy of the draft EA to you for review and comment later this year.

To aid in the preparation of the EA, and to meet obligations under Section 106 of the NHPA to take into account the effects of undertakings by federal agencies, DOE is requesting any additional information your office has on historic properties or cultural resources within 1 mile of the proposed project site. In addition, if you agree with DOE's determination that there will be no effects to historic or archaeological resources, please concur, as your concurrence is required for DOE's record of compliance under Section 106. Letters have also been sent to two area Indian Nations on Long Island to initiate consultation; the Shinnecock Indian Nation, a federally recognized tribe, and the Unkeehaug Indian Nation of Poospatuck Indians, a state recognized tribe.

If you have any questions about this consultation, please contact:

Melissa Rossiter  
NEPA Document Manager  
U.S. Department of Energy  
Golden Field Office  
1617 Cole Boulevard,  
Golden, Colorado 80401  
melissa.rossiter@go.doe.gov  
Phone: 720-356-1566

Sincerely,



Melissa Rossiter  
NEPA Document Manager

Enclosures: Attachment 1, NYSHPO Project Review Cover Form  
Figures 1 to 5

Attachment 1: Project Review Cover Form.



**New York State Office of Parks, Recreation and Historic Preservation**  
**Historic Preservation Field Services Bureau**  
 Pelee Island Resource Center, PO Box 188, Waterford, NY 12188-0188 (Mail)  
 Delaware Avenue, Cohoes 12047 (Delivery)

(518) 237-8543

**PROJECT REVIEW COVER FORM** Rev. 5/08

*Please complete this form and attach it to the top of any and all information submitted to this office for review. Accurate and complete forms will assist this office in the timely processing and response to your request.*

This information relates to a previously submitted project.

PROJECT NUMBER      PR       
 COUNTY     

If you have checked this box and noted the previous Project Review (PR) number assigned by this office you do not need to restate unless any of the required information below has changed.

2. This is a new project.

If you have checked this box you will need to complete ALL of the following information.

Project Name Town of Hempstead Wind to Hydrogen Project  
 Location 320 Lido Blvd  
You MUST include street number, street name and/or County, State or interstate route number if applicable.  
 City/Town/Village Point Lookout  
List the correct municipality in which your project is being undertaken. If it is a hamlet you must also provide the name of the town.  
 County Nassau  
If your undertaking\* covers multiple communities/counties please attach a list defining all municipalities/counties included.

**TYPE OF REVIEW REQUIRED/REQUESTED** (Please answer both questions)

A. Does this action involve a permit approval or funding, now or ultimately from any other governmental agency?

No  Yes

If Yes, list agency name(s) and permit(s)/approval(s)

Agency Involved	Type of permit/approval	State	Federal
<u>U.S. Department of Energy</u>	<u>Funding and NEPA Compliance</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>U.S. Fish and Wildlife Service</u>	<u>Endangered Species Act-Section 7</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>NY Dept. of State/NOAA</u>	<u>Coastal Zone Consistency Review</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

B. Have you consulted the NYSHPD web site at <http://nysparks.state.ny.us> to determine the preliminary presence or absence of previously identified cultural resources within or adjacent to the project area? If yes:

Yes  No

Was the project site wholly or partially included within an identified archeologically sensitive area?

Yes  No

Does the project site involve or is it substantially contiguous to a property listed or recommended for listing in the NY State or National Registers of Historic Places?

Yes  No

CONTACT PERSON FOR PROJECT	
Name <u>Melissa Rossiter</u>	Title <u>NEPA Document Manager</u>
Firm/Agency <u>U.S. Department of Energy - Golden Field Office</u>	
Address <u>1617 Cole Blvd</u>	City <u>Golden</u> STATE <u>CO</u> Zip <u>80401</u>
Phone (720) 356-1566	Fax (720) 356-1566 E-Mail <u>Melissa.rossiter@go.doe.gov</u>

\*\*<http://nysparks.state.ny.us> then select HISTORIC PRESERVATION then select On Line Resources

Figure 1. U.S. Geological Survey 7.5-minute Jones Inlet Quadrangle showing location of the area of potential effect.

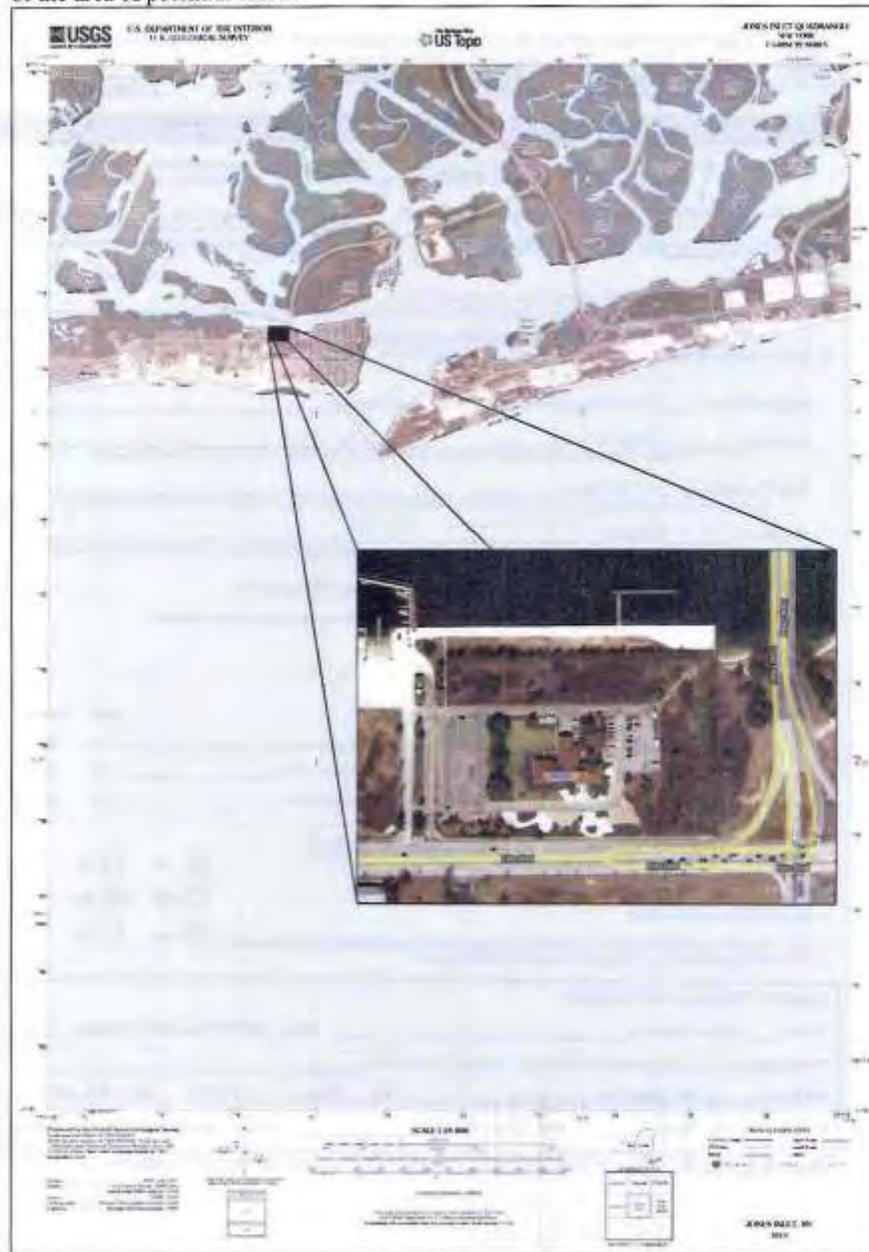


Figure 2. General location of proposed project in Point Lookout, New York.



Figure 3. Town of Hempstead Clean Energy Project site showing existing facilities and proposed project elements.

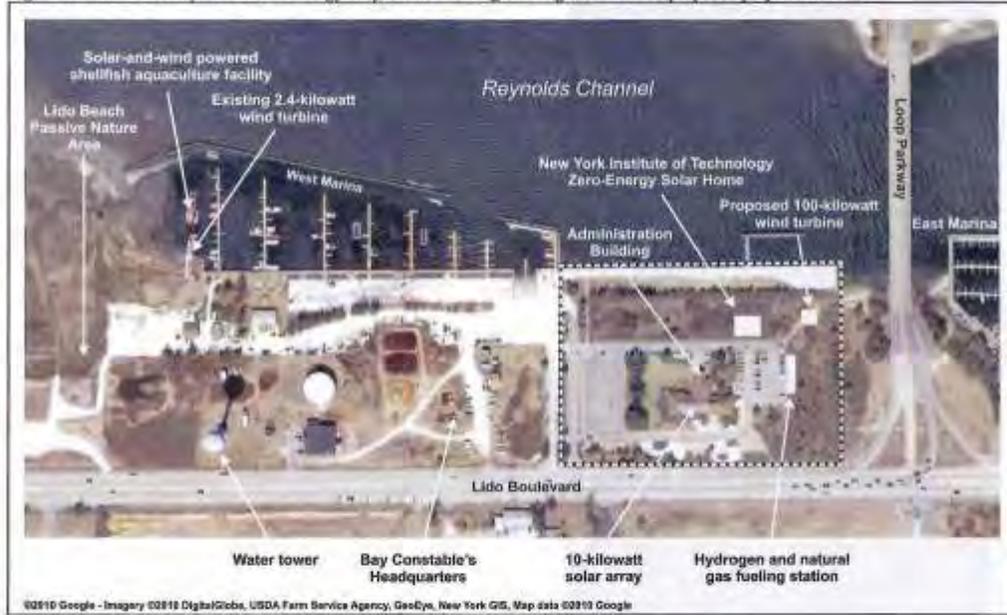


Figure 4. Site of the proposed undertaking.



Figure 5. View of the wind turbine site.





**New York State Office of Parks,  
Recreation and Historic Preservation**

Historic Preservation Field Services • Peebles Island, PO Box 189, Waterford, New York 12188-0189

518-237-8643

[www.nysparks.com](http://www.nysparks.com)

David Patterson  
Governor

Carol Ash  
Commissioner

November 8, 2010

Melissa Rossiter, NEPA Document Manager  
US Department of Energy  
Golden Field Office  
1617 Cole Boulevard  
Golden, CO 80401

Re: DOE  
Wind to Hydrogen Project  
320 Lido Boulevard  
Point Lookout/Town of Hempstead, Nassau County  
10PR06977

Dear Ms. Rossiter:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO) regarding the proposed Point Lookout Wind to Hydrogen project. We have reviewed the materials submitted in accordance with Section 106 of the National Historic Preservation Act of 1966 and the relevant implementing regulations.

We understand you are requesting additional information about the historic and cultural resources nearby and the project's potential impact on those resources. As I mentioned over the telephone today, Daniel Bagrow of our Archaeology Unit informed me that the archaeology site to which you refer is not close enough to the project area to be affected. He has no archaeology concerns. Above-ground resources are a different matter. We would like to see the photo-simulations you indicated would be included in the draft EA to evaluate the visual effects on the nearby resources prior to making a determination.

In addition, we recommend you contact both the Delaware Nation and the Delaware Tribe to initiate consultation. According to our records, both these Indian Nations have expressed interest in the western Long Island area. Their contact information is attached.

We look forward to reviewing the EA and to continued consultation as the project proceeds. If you have any questions, I can be reached at (518) 237-8643, ext. 3287. Please refer to the SHPO Project Review (PR) number in any future correspondences regarding this project.

Sincerely,

Elizabeth Martin  
Historic Site Restoration Coordinator  
e-mail: [elizabeth.martin@oprhp.state.ny.us](mailto:elizabeth.martin@oprhp.state.ny.us)

Enclosure

via email only

An Equal Opportunity Employer/Affirmative Action Agency

**Delaware Nation (Federally Recognized)**

**Tamara Francis, NAGPRA Director**

Delaware Nation of Oklahoma

P.O. Box 825

Anadarko, OK 73005

Phone: (405) 247-2448

Fax: (405) 247-9393

Email: [tfrancis@delawarenation.com](mailto:tfrancis@delawarenation.com)

**Delaware Tribe (Federally Recognized)**

Dr. Brice Obermeyer

1417 West Street

Emporia, KS 66801

Phone: (918) 335-7026

Email: [briceobermeyer@yahoo.com](mailto:briceobermeyer@yahoo.com)













**New York State Office of Parks,  
Recreation and Historic Preservation**

Historic Preservation Field Services Bureau  
P.O. Box 189, Waterford, New York 12188-0189  
518-237-8643

**Andrew M. Cuomo**  
Governor

**Andy Beers**  
Acting Commissioner

January 7, 2011

Melissa Rossiter  
NEPA Document Manager  
Department of Energy  
Golden Field Office, 1617 Cole Boulevard  
Golden CO 80401-3393

Dear Ms. Rossiter:

Re: DOE  
Wind to Hydrogen project  
320 Lido Boulevard, Point Lookout  
Town of Hempstead, Nassau County  
10PR06977

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

The New York State Historic Preservation Office concurs with the Department of Energy's determination that this project will have No Effect on historic resources either listed on or determined eligible for listing on the National Register of Historic Places.

I'd like to thank you for your cooperation in providing additional materials throughout our review process so that we could better understand the project. If anyone has any questions, or if I can be of any assistance, please call me at (518) 237-8643, ext. 3271.

Sincerely

Julian W. Adams  
Sr. Historic Sites Restoration Coordinator  
NYSIPO

CC: Jeff Meyers, NYOPRHP Counsel's Office



**Department of Energy**

Golden Field Office  
1617 Cole Boulevard  
Golden, Colorado 80401-3498

September 16, 2010

Mr. Steve Papa  
Senior Fish and Wildlife Biologist  
U.S. Fish and Wildlife Service  
Long Island Field Office  
3 Old Barto Road  
Brookhaven, NY 11719

Subject: Town of Hempstead Wind to Hydrogen Project – Section 7 Consultation

Dear Mr. Papa:

The U.S. Department of Energy (DOE or the Department) is proposing to provide a financial assistance grant, under the America Recovery and Reinvestment Act of 2009, to the Town of Hempstead, New York (the Town), to construct and operate a 100-kilowatt wind turbine. The wind turbine would be collocated with, and supply electricity to, the Town's existing hydrogen and natural gas fueling station at 320 Lido Boulevard, Point Lookout, New York, in Nassau County. DOE's Golden Field Office is currently preparing an environmental assessment (EA) for the proposed project to meet the requirements of the National Environmental Policy Act of 1969.

The proposed project would involve the installation of a 100-kilowatt wind turbine in the northeast corner of the same site as the Town's fueling station. The total fueling station site is about 4 acres of Town-owned land between Reynolds Channel to the north and Lido Boulevard to the south, and between the marina access road to the west and Loop Parkway to the east. Figure 1 shows the location of Point Lookout, New York, within Nassau County and the Town of Hempstead. Figure 2 provides a satellite view of the Town's Clean Energy Project facilities and the proposed wind turbine project location within its boundaries. Figure 3 is a closeup of the proposed 4-acre site. The site is about one-quarter mile from the eastern boundary of the Lido Beach Passive Nature Area.

The permanent footprint for the wind turbine would be about 950 square feet. A temporary construction staging and laydown area would occupy 4,500 square feet and a temporary crane pad area would occupy about 1,200 square feet. The proposed turbine would weigh approximately 23 tons with a hub about 121 feet above the ground. The turbine would have three blades, each about 33 feet long. The diameter of the rotor is about 69 feet so the tips of the blades would extend from approximately 96 feet above ground to about 156 feet.

The U.S. Fish and Wildlife Service's *Federally Listed Endangered and Threatened Species and Candidate Species in New York (By County)*, last updated on June 17, 2010, reports six federally protected species that occur in Nassau County; the table below identifies the species.



Common Name	Scientific Name	Federal Status
Piping plover (bird)	<i>Charadrius melodus</i>	Threatened
Roscate tern (bird)	<i>Sterna dougalli dangalli</i>	Endangered
Sandplain gerardia (plant)	<i>Agalinis acuta</i>	Endangered
Seabeach amaranth (plant)	<i>Amaranthus pumilus</i>	Threatened
Shortnose sturgeon (fish)	<i>Acipenser brevirostrum</i>	Endangered
Small whorled pogonia (plant)	<i>Isotroria medeolides</i>	Threatened

None of the above species are known to occur on the proposed wind turbine site.

Please confirm that this list is current and provide any relevant information you might have that could aid DOE in its EA. This information will assist the Department in meeting its obligations under Section 7 of the Endangered Species Act. We also request any information you may have on the presence of bald eagles and migratory birds that would be important for evaluating impacts in the EA.

Issues the EA will consider include noise, shadow flicker, migratory bird and bat mortality, and proximity of eagles and endangered or threatened species. The EA will include evaluation of safety issues in relation to potential incidents that could occur due to icing and high winds.

Please respond within 30 days of receipt of this letter to ensure DOE can address your comments or concerns and to facilitate the consultation process. The Department does not plan to hold a formal public scoping meeting for this project, but is soliciting scoping comments by mail and through the its Golden Field Office Public Reading Room at:

[http://www.eere.energy.gov/golden/reading\\_room.aspx](http://www.eere.energy.gov/golden/reading_room.aspx).

DOE will send a copy of the draft EA to you for review and comment later this year. The EA will include correspondence between DOE and your office in an appendix to the EA.

Please forward any information you might have and any requests for additional information to:

Melissa Rossiter  
 NEPA Document Manager  
 U.S. Department of Energy  
 Golden Field Office  
 1617 Cole Boulevard,  
 Golden, Colorado 80401  
[melissa.rossiter@go.doe.gov](mailto:melissa.rossiter@go.doe.gov)  
 Phone: 720-356-1566

Sincerely,



Melissa Rossiter  
NEPA Document Manager

Enclosures: Figures 1 to 3

Figure 1. General location of Point Lookout, Town of Hempstead, Nassau County, New York.



Figure 2. Town of Hempstead Clean Energy Project site showing existing facilities and proposed project elements.

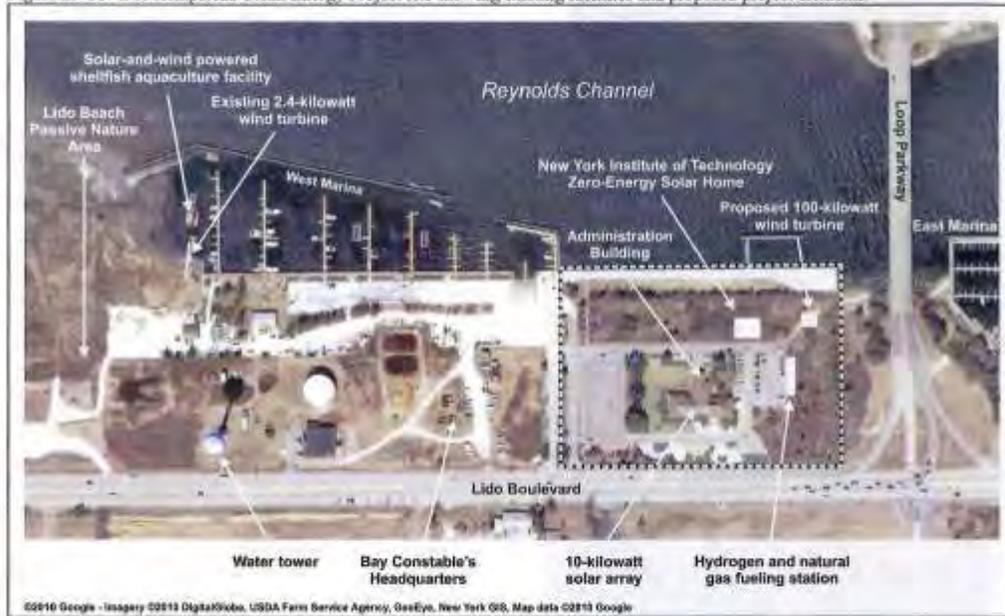


Figure 3. Closeup of proposed 4-acre site.





**Department of Energy**

Golden Field Office  
1617 Cole Boulevard  
Golden, Colorado 80401-3993

September 16, 2010

Randy King, Chairperson  
Shinnecock Indian Nation  
P.O. Box 5006  
Southampton, NY 11969

Subject: Town of Hempstead Wind to Hydrogen Project – Tribal Consultation

Dear Chairperson King:

Pursuant to Section 106 of the National Historic Preservation Act and 36 CFR Part 800, the U.S. Department of Energy (DOE or the Department) is initiating the consultation process on a proposed project to determine any potential effects on Shinnecock Indian Nation properties of traditional religious and cultural significance. This National Historic Preservation Act compliance process is being conducted concurrently with the preparation of an environmental assessment (EA) pursuant to the National Environmental Policy Act (NEPA) of 1969. DOE is also conducting public scoping for this proposed project. The Department will post a scoping letter on the Golden Field Office Public Reading Room website at:

[http://www.eere.energy.gov/golden/reading\\_room.aspx](http://www.eere.energy.gov/golden/reading_room.aspx).

Pursuant to the requirements of NEPA, Council on Environmental Quality regulations (40 CFR Parts 1500 to 1508), and DOE's NEPA implementing procedures (10 CFR Part 1021), DOE is preparing the draft EA to:

- Identify any adverse environmental effects and potential associated mitigation measures should this proposed action be implemented;
- Evaluate viable alternatives to the proposed action, including a no action alternative;
- Describe the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and
- Characterize any irreversible and irretrievable commitments of resources that would be involved should this proposed action be implemented.

DOE's Proposed Action is to provide a financial assistance grant under the American Recovery and Reinvestment Act of 2009 to the Town of Hempstead to facilitate the construction and operation of a 100-kilowatt wind turbine at Point Lookout, Town of Hempstead, Nassau County, New York (the proposed undertaking). Figure 1 is the U.S. Geological Survey 7.5-minute Jones Inlet quadrangle that shows the area of potential effect (APE). For purposes of evaluation, the



Department considers the tower footprint, the crane pad, and the construction staging and laydown areas as the direct APE. In addition, the EA will evaluate a larger area for some resources areas such as aesthetics. Figure 2 shows the general location of Point Lookout within the Town of Hempstead and the greater Long Island and New York City region.

The Town of Hempstead's undertaking would be collocated with the Town's existing hydrogen and natural gas fueling facility at 320 Lido Boulevard, Point Lookout, New York. The proposed project site is within Nassau County. Point Lookout is located at the east end of a barrier island that lies between Reynolds Channel and the Atlantic Ocean.

The Town owns and operates a hydrogen and natural gas fueling station at Point Lookout. The station currently uses electricity from the grid to run an electrolyzer to generate hydrogen. The hydrogen and natural gas are stored on the site in existing aboveground storage tanks. The Town dispenses pure hydrogen, a natural gas blend, and compressed natural gas to fuel a small fleet of Town vehicles. The wind turbine would generate renewable electricity to run the electrolyzer to generate hydrogen.

The Town's proposed wind turbine site is a heavily vegetated area. There are no existing buildings or structures on the proposed wind turbine site. The total project site is approximately 4 acres of Town-owned land. The site contains an administration building, the hydrogen-fueling station, and a zero-energy solar home; it is located between Lido Boulevard on the south and the channel on the north, and between the eastern boundary of the Town's property and the entrance driveway on the west. The wind turbine installation would be in the northeast corner of the site and require a permanent concrete foundation of approximately 950 square feet. Dependent on the results of geotechnical investigations, a deep concrete foundation and/or pilings could be necessary to support the tower. No guy wires or fencing would be used. Figure 3 provides a satellite view of the Town's Clean Energy Project facilities and the proposed wind turbine project location within its boundaries. Figure 4 is a closeup of the proposed 4-acre site.

Site preparation activities would include the clearing of heavy brush around the wind turbine site. Two construction trailers would be placed in the parking lot of the Administration Building. Access to the wind turbine site would be developed from the parking lot. The wind turbine components would be delivered by truck in two shipments. For tower installation, a 100-ton crane would be used. A temporary crane pad area would occupy 1,200 square feet. A temporary construction staging and laydown area would encompass an area of about 4,500 square feet. Electrical tie-in to the fueling station would be underground and would require additional switchgears. For purposes of evaluation, the Department considers the tower footprint, the crane pad, and the construction staging and laydown areas as the direct APE. In addition, the EA will evaluate a larger area for some resource areas such as aesthetics. Figure 5 shows a view of the proposed wind turbine site.

The proposed turbine would weigh approximately 23 tons with a hub about 121 feet above the ground. The turbine would have three blades, each about 33 feet long. The diameter of the rotor is about 69 feet so the tips of the blades would extend from approximately 96 feet above ground to about 156 feet. The tower would be constructed of steel, the nacelle cover and blades would be constructed of a fiberglass composite. The wind turbine would operate with a variable rotor speed ranging from 0 to 59 revolutions per minute. The cut-in speed of 7.8 miles per hour is the

minimum wind speed necessary to operate the turbine. The wind cut-out speed is 56 miles per hour. The extreme wind speed is 133 miles per hour.

The EA will describe all potential impacts of the proposed project on the environment and will identify possible mitigation measures to reduce or eliminate those impacts. The EA will describe the potentially affected environment and the impacts that could result to:

- Water Resources
- Historic and Cultural Resources
- Biological Resources
- Noise
- Aesthetics and Visual Resources
- Socioeconomics
- Environmental Justice
- Occupational and Public Health and Safety

DOE has determined the proposed project would not affect tribal resources or artifacts in the Point Lookout area and the APE; however, you are invited to participate in the consultation process by providing comments about the importance of any cultural resource site(s) near the proposed project. DOE is requesting this information to aid in the preparation of the EA and to meet DOE's obligations under Section 106 of the National Historic Preservation Act, as well as the Native American Graves Protection and Repatriation Act of 1990.

Please respond within 30 days of receipt of this letter to ensure DOE can address your comments or concerns and to facilitate the consultation process. The Department does not plan to hold a formal public scoping meeting for this project, but is soliciting scoping comments by mail and through the Golden Field Office Public Reading Room at:

[http://www.eere.energy.gov/golden/reading\\_room.aspx](http://www.eere.energy.gov/golden/reading_room.aspx)

DOE will send a copy of the draft EA to you for review and comment later this year. The EA will include correspondence between DOE and your office in an appendix to the EA.

If you have questions or comments concerning the project please contact:

Melissa Rossiter  
NEPA Document Manager  
U.S. Department of Energy  
Golden Field Office  
1617 Cole Boulevard,  
Golden, Colorado 80401  
[melissa.rossiter@go.doc.gov](mailto:melissa.rossiter@go.doc.gov)  
Phone: 720-356-1566

This letter and the draft EA will be posted to the Golden Field Office electronic reading room when they become available.

Sincerely,



Melissa Rossiter  
NEPA Document Manager

Enclosures: Figures 1 to 5

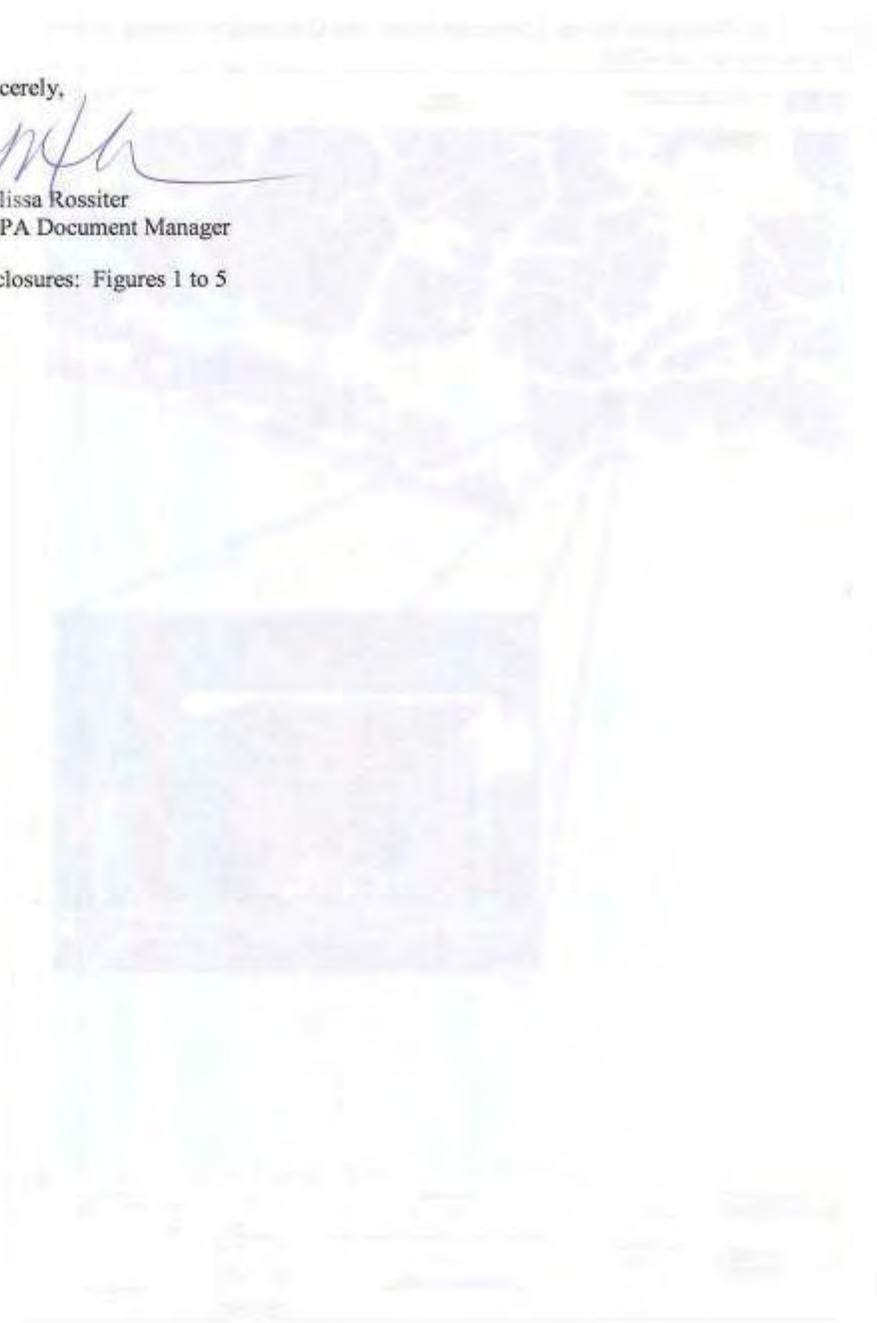


Figure 1. U.S. Geological Survey 7.5-minute Jones Inlet Quadrangle showing location of the area of potential effect.

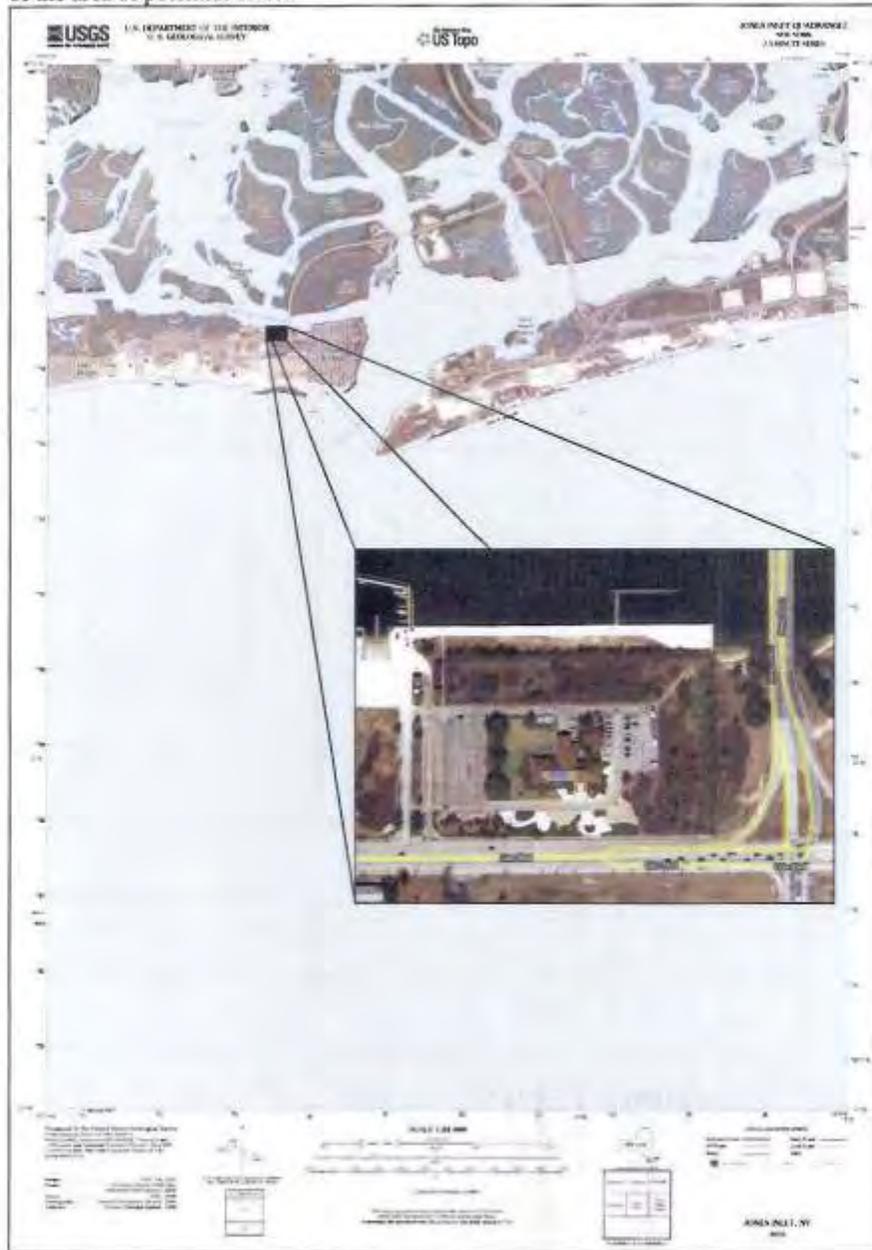


Figure 2. General location of Point Lookout, Town of Hempstead, Nassau County, New York.



Figure 3. Town of Hempstead Clean Energy Project site showing existing facilities and proposed project elements.

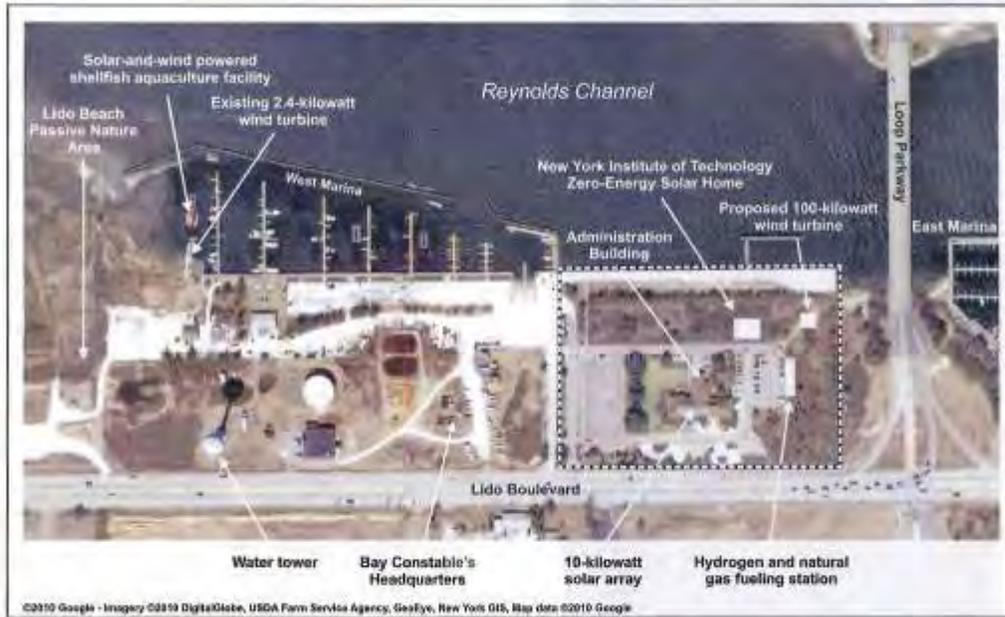


Figure 4. Site of the proposed undertaking.



Figure 5. View of the wind turbine site.



Figure 5. View of the wind turbine site.





Delaware Tribe of Indians  
170 NE Barbara  
Bartlesville, Oklahoma 74006  
(918) 336-5272 FAX (918) 337-6591

December 13, 2010

Department of Energy  
Attn: Melissa Rossiter  
Golden Field Office  
1617 Cole Boulevard  
Golden, CO 80401-3393

Re: Town of Hempstead Wind to Hydrogen Project on Long Island, New York

Dear Melissa Rossiter:

Thank you for informing the Delaware Tribe on the proposed construction associated with the above referenced project. Our review indicates that there are no religious or culturally significant sites in the project area. As such, we defer comment to your office as well as to the State Historic Preservation Office and/or the State Archaeologist.

We wish to continue as a consulting party on this project and look forward to receiving a copy of the cultural resources survey report if one is performed. We also ask that if any human remains are accidentally unearthed during the course of the survey and/or the construction project that you cease development immediately and inform the Delaware Tribe of Indians of the inadvertent discovery.

If you have any questions, please feel free to contact this office by phone at (918) 335-7026 or by e-mail at [bobermeyer@delawaretribe.org](mailto:bobermeyer@delawaretribe.org)

Sincerely,

A handwritten signature in cursive script that reads "Brice Obermeyer".

Brice Obermeyer  
Delaware Tribe Historic Preservation Office  
1417 West St  
Emporia, KS 66801



## APPENDIX B NEW YORK SPECIAL-STATUS PLANT SPECIES

The following tables list New York endangered, threatened and rare plant species that might occur in the project area.

**Table B-1. State of New York endangered plant species.**

Common name	Scientific Name
Barratt's sedge	<i>Carex barrattii</i>
Coast violet	<i>Viola brittoniana</i>
Coastal goldenrod	<i>Solidago latissimifolia</i>
Collins' sedge	<i>Carex collinsii</i>
Creeping St. John's-wort	<i>Hypericum adpressum</i>
Cut-leaved evening-primrose	<i>Oenothera laciniata</i>
Downy lettuce	<i>Lactuca hirsuta</i>
Few-flowered nutrush	<i>Scleria pauciflora</i> var. <i>caroliniana</i>
Golden dock	<i>Rumex fueginus</i>
Green parrot's-feather	<i>Myriophyllum pinnatum</i>
Hyssop-skullcap	<i>Scutellaria integrifolia</i>
Midland sedge	<i>Carex mesochorea</i>
Orange milkwort	<i>Polygala lutea</i>
Pink wild bean	<i>Strophostyles umbellata</i>
Prairie wedgegrass	<i>Sphenopholis obtusata</i>
Retrorsed flatsedge	<i>Cyperus retrorsus</i> var. <i>retrorsus</i>
Rough rush-grass	<i>Sporobolus clandestinus</i>
Salt-meadow grass	<i>Leptochloa fusca</i> ssp. <i>fascicularis</i>
Sandplain gerardia	<i>Agalinis acuta</i>
Seabeach amaranth	<i>Amaranthus pumilus</i>
Seaside bulrush	<i>Bolboschoenus maritimus</i> ssp. <i>paludosus</i>
Silvery aster	<i>Symphotrichum concolor</i> var. <i>concolor</i>
Slender spikegrass	<i>Chasmanthium laxum</i>
Small whorled pogonia	<i>Isotria medeoloides</i>
Smooth tick-trefoil	<i>Desmodium laevigatum</i>
Soapwort gentian	<i>Gentiana saponaria</i>
Stiff cowbane	<i>Oxypolis rigidior</i>
Swamp aster	<i>Eurybia radula</i>
Virginia ground-cherry	<i>Physalis virginiana</i> var. <i>virginiana</i>
Weak rush	<i>Juncus debilis</i>
White milkweed	<i>Asclepias variegata</i>
Yellow flatsedge	<i>Cyperus flavescens</i>

**Table B-2. State of New York threatened plant species.**

<b>Common Name</b>	<b>Scientific Name</b>
Brown bog sedge	<i>Carex buxbaumii</i>
Bushy rockrose	<i>Crocianthemum dumosum</i>
Dune sandspur	<i>Cenchrus tribuloides</i>
Featherfoil	<i>Hottonia inflata</i>
Flax-leaf whitetop	<i>Sericocarpus linifolius</i>
Fringed boneset	<i>Eupatorium torreyanum</i>
Globe-fruited Ludwigia	<i>Ludwigia sphaerocarpa</i>
Green milkweed	<i>Asclepias viridiflora</i>
Little-leaf tick-trefoil	<i>Desmodium ciliare</i>
Marsh straw sedge	<i>Carex hormathodes</i>
Northern bog aster	<i>Symphotrichum boreale</i>
Oakes' evening-primrose	<i>Oenothera oakesiana</i>
Persimmon	<i>Diospyros virginiana</i>
Red pigweed	<i>Chenopodium rubrum</i>
Saltmarsh aster	<i>Symphotrichum subulatum</i> var. <i>subulatum</i>
Sea-pink	<i>Sabatia stellaris</i>
Slender crabgrass	<i>Digitaria filiformis</i>
Small floating bladderwort	<i>Utricularia radiata</i>
Southern yellow flax	<i>Linum medium</i> var. <i>texanum</i>
Stargrass	<i>Aletris farinosa</i>
Stiff-leaf goldenrod	<i>Oligoneuron rigidum</i> var. <i>rigidum</i>
Swamp lousewort	<i>Pedicularis lanceolata</i>
Swamp sunflower	<i>Helianthus angustifolius</i>
Velvety bush-clover	<i>Lespedeza stuevei</i>

**Table B-3. State of New York rare plant species.**

<b>Common Name</b>	<b>Scientific Name</b>
Narrow-leaved bush-clover	<i>Lespedeza angustifolia</i>
Seabeach knotweed	<i>Polygonum glaucum</i>
Atlantic white cedar	<i>Chamaecyparis thyoides</i>